

FEBRUARY, 1954

BUTANE-PROPANE *News*

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- 7 Extra Strong Tank Supports, Integrally Welded to the Tank



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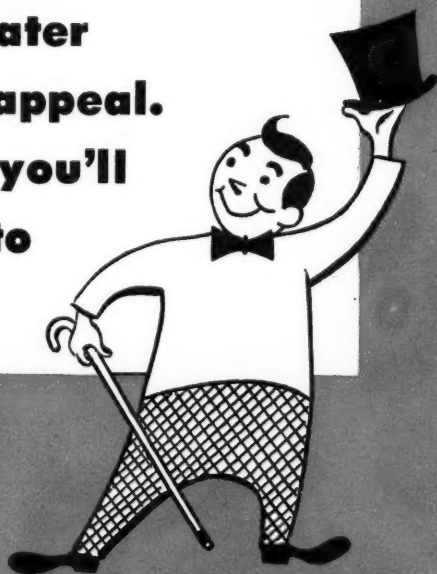




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Cylinders you'll
be proud to
deliver.**

The popular
RC-100A



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LP-GAS CONTAINERS FROM ONE POUND TO 30,000 GALLONS

Men
Who Have
Built Their
Business
On Metered
Service
Know . . .

From left: Hartley Barker, Don Putnam, Miles Barker, Lee H. Barker, President, and Jack Peters, all of Wisconsin Rapids Gas and Electric Company, inspecting ROCKWELL LP-Gas meters.



ROCKWELL LP-GAS METERS

READ WHAT Miles H. Barker, Vice President, Wisconsin Rapids Gas and Electric Co. has to say about lightweight, attractive ROCKWELL LP-Gas Meters . . .



WISCONSIN RAPIDS GAS AND ELECTRIC COMPANY
WISCONSIN RAPIDS, WISCONSIN
February 26, 1953

Rockwell Manufacturing Co.
Pittsburgh 8, Pennsylvania
Gentlemen:

We started our propane business back in 1933 using meters on our tanks and mains. Down through the years we have continued to use meters for all sizes of tanks, and our metered service has been recognized through the central part of our state as being the finest and most deluxe propane gas service available.

Customers enjoy the convenience of metered service, inasmuch as the responsibility of keeping the tank filled and reading the meter rests with us. Where other types of service and our service are both available, our metered service is the choice by the majority of those using gas.

We have used several makes of meters since starting in the gas business, and we are happy to say that we have been using Rockwell meters exclusively since before the war. They are well designed and easy to install. Rockwell has always rendered excellent and prompt service, and it has been a pleasure to do business with them.

Very truly yours,

WISCONSIN RAPIDS GAS AND ELECTRIC COMPANY

Miles H. Barker
Vice President

Miles Barker/cmp

SAVE MONEY by lowering operating costs, guiding truck route planning and simplifying storage and inventory problems.

EARN GOODWILL of customers by providing a metered bill based on a device they can check, reducing the possibility of error to a minimum.

SELL NEW CUSTOMERS on your service by assuring them an adequate supply of gas at all times and permitting them to pay for gas as they use it.

ROCKWELL MANUFACTURING COMPANY

PITTSBURGH 8, PA. Atlanta Boston Chicago Houston Los Angeles
New York N. Kansas City Pittsburgh San Francisco Seattle Tulsa
In Canada: Peacock Brothers Limited



Sales office and plant of Wisconsin Rapids Gas and Electric Company.

YOU CAN RELY ON ROCKWELL



BUTANE-PROPANE

NBP

News

VOLUME 16 • NUMBER 2

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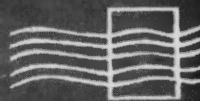
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LETTERS



Headquarters

for L.P. gas Information

Since 1931

Italy

How do they wash out L. P. gas storage tanks?

Do they use a special solution?

What do they make when a storage tank comes from the manufacturer?

I.A.B.

We do not believe we understand the question in your letter. Do you mean, how are L. P. gas storage tanks cleaned before they leave the manufacturer's plant or do you refer to tanks which have been in service and it is then desired to clean them?

Tanks, when completed by the manufacturer, are merely brushed and swept out before the last head is welded in place. They are then filled with water for the hydrostatic test, after which the water is drained from them. Some manufacturers dry the tanks after draining them by heating them. Openings are then plugged, or the fittings are installed.

Tanks which require cleaning after having been in service are emptied of liquid and all vapors are removed by burning them off through a pipe which carries them well away from the tank. The tank is then thoroughly steamed to clean it. See page 42 of this issue.—Ed.

Ohio

We have two tricky problems which you might be able to help us with.

1. Would it be practical or dangerous to transfer liquid butane from a large tank to a smaller one by charging the first tank with a small quantity of propane, thereby increasing vapor pressure in that tank and forcing the butane up the dip tube and into the second tank?

2. We are to supply propane in liquid form to the manifold of an experimental internal combustion engine for a testing laboratory. Eight 100-lb. I.C.C. propane cylinders with dip tubes extending to the bottom will be manifolded together. Coming off the manifold will be a relief valve,

an excess flow check valve, a main shutoff valve, and another relief valve.

The engineers conducting the tests desire to have the liquid propane entering the engine manifold at approximately 15 psig to simulate conditions encountered at extremely low temperatures. If a Rego type 466 or 467 high pressure regulator is installed in the supply line immediately following the second relief valve, will liquid or vapor or a combination of both be drawn into the manifold?

Is it actually possible for the pressure of the liquid to be only 18 lbs. when flowing, even though the ambient room temperature in the laboratory may reach 85°?

The tanks and manifold and regulating equipment will be located outside, 40 ft. from the laboratory room with ½-in. O.D. type K copper tubing run directly to the engine. The maximum rate of draw will be 65 lb. per hour. What will be the conditions in our supply line under various conditions of no draw, light, medium, and heavy draw? When the engine is first started, how long will it take the liquid propane to reach the manifold at the engine?

Our basic problem is trying to understand what effect the regulator will have on the flow of liquid and its pressure into the supply line. Will the supply line frost up? Is it necessary to insulate the line?

J.K.

Question 1: It is possible to increase the pressure in the first tank by increasing the proportion of propane. However, if the propane is added as liquid to the liquid butane, the increase in pressure will be only in the ratio of the increased percentage of propane added. If vapor from propane in a propane vessel is introduced to the vapor space, the increased pressure will be more pronounced and the transfer of liquid to the second tank will probably be at a satisfactory rate. A differential

pressure of 10 to 15 pounds between the first and second tank should provide a good transfer rate. However, propane should not be placed in a vessel unless the vessel is designed for such service.

Question 2: A combination of liquid and vapor will be in the manifold on the discharge side of the regulator. It will not be possible to have liquid only flowing in the reduced pressure manifold unless some method of refrigerating the line is provided to condense the vapors which are formed when the liquid pressure is reduced. The heat in the liquid propane causes vaporization of a portion of the liquid when its pressure is reduced to 18 lb. It will require considerable calculation to estimate the conditions of flow which you mentioned. Heat transfer from the atmosphere to the low pressure manifold will vaporize much of the liquid which is not "flashed" at the regulator. Even at the full rate of flow of 65 lb. per hour, we doubt if much liquid will reach the engine through 40 ft. of ½-in. copper tubing.

The supply line should not frost up except for a short distance at the approach to the regulator where conduction of heat from the line to the regulator cools it down. The low pressure line downstream from the regulator may frost heavily its full length.—Ed.

Minnesota

We would appreciate hearing from you as to whether any method has been developed using propane to refrigerate semi-trailers. These trailers contain approximately 1500 cu. ft. of space, and should be refrigerated to 35° F above zero.

C.B.

No method that we know of has been developed using propane to refrigerate semi-trailers.

It has been done on trucks and has proved feasible. The process was patented but was not developed because of expense and lack of market at the time. The L. P. gas was expanded into the refrigerator coil in the truck body and drawn from there to the carburetor for motor fuel.

STOPPERS FOR STORE SALES

FROM Rheem Coppermatic



Rheem Coppermatic makes NEWS—and news makes SALES! Here is the lowest cost copper-tank water heater, different from all others, with every sales advantage—

And so your whole new Rheem Coppermatic sales story is a "stopper"—from the sensational 4-color national advertising in top magazines to your local displays, mailings and newspaper advertisements!

Use the big 3-dimensional copper foil cutaway display shown below on the right—actual size, 5-ft. high. Use the presentation book to sell prospects and train salesmen. Use the hard-selling envelope stuffers to tell the Coppermatic news for little more than the cost of mailing! And choose from a big selection of newspaper ads—proved successful in every test!



RUST PROOF

Rheem Coppermatic

AUTOMATIC STORAGE GAS WATER HEATER



A COMPLETE COPPER TANK
Outlasts ordinary heaters in corrosion areas many times over.
Can't rust—anywhere!

CASH IN — Send coupon below!



INSIDE A COMPLETE STEEL TANK
Both tanks have super-strong capsule shapes. Pressure-Proved at double the normal pressure!



HEATS QUICKER
Recovers faster! Delivers practically a continuous supply of hot water. Handsome, white steel cabinet fits kitchens, basements, closets.

You can rely on



BP-2
Send your request to nearest Sales Office, addresses of which are listed at right.

Please send full information on Rheem Coppermatic profits, advertising and promotion.

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World's largest manufacturer of automatic storage water heaters

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4361 Firestone Blvd., South Gate, Calif.
800 Chesley Ave., Richmond, Calif.
3693 E. Marginal Way, Seattle, Wash.

However, L. P. gas codes would not permit this on a semi-trailer or trailer. (See Pamphlet 58, paragraph 4.1a.)—Ed.

Nebraska

Both propane and anhydrous ammonia are in common use in this region. Often farmers ask if propane and ammonia can be used in the same tanks if they are equipped with stainless steel fittings.

I am under the impression, perhaps erroneously, that propane and ammonia will not mix; that there is a chemical reaction when these two liquids come together in the same vessel and that an explosion may result.

I have heard it stated that the steel becomes impregnated with anhydrous ammonia and that it is impossible to remove this gas which has buried itself in the poses of the steel and that when a tank which has been used for ammonia is filled with propane dire results happen.

Do you have any reliable information that will be of help?

A.T.B.

It is not considered safe to use the same storage vessel interchangeably with anhydrous ammonia, even though the valves and accessories are steel.

It is very difficult to remove the last traces of either product from a storage vessel unless special equipment is available for the cleaning process. Unless the vessel is thoroughly and properly cleaned, the product entering the vessel will be contaminated with the previous product that was in the vessel, and possibly with the cleaning materials.

It is doubtful if an explosion would occur if the two products mixed in the vessel, but the anhydrous ammonia that might mix with the propane could be quite corrosive to regulator and appliance parts. Also, under certain conditions of combustion, anhydrous ammonia and L. P. gases are capable of forming a poisonous gas.

We recommend that you continue to discourage farmers from using the same vessel for both products.—Ed.

Iowa

We are planning on converting a 15 hp. natural gas Mund steam boiler to L. P. gas.

The orifices are No. 50 for natural gas, what size would you recommend for L. P. gas?

We plan on using a No. V 499 Minn. valve and a No. 150 McDonnell-Miller as controls on this unit, which should be satisfactory.

If you have any other suggestions on the conversion of this type of boiler, we would appreciate knowing about them.

Could you supply us with a natural gas-propane gas conversion

table? It would be helpful in this type of work.

R.B.G.

The No. 50 orifice will pass about 20,000 Btu of natural gas at 8 in. wc. pressure. (You didn't give us the pressure of the natural gas). The input rating of the burner should be somewhere on the boiler. A No. 54 orifice will pass about 21,000 Btu of propane and a No. 55 will pass about the same amount of butane—both operating under 11 in. wc. pressure.

We suggest, however, that you contact the Mund Boiler Co., Los Angeles, and obtain their opinion and recommendations.

We do not have a conversion chart available for natural gas to propane. The delivery pressure of natural gas varies from city to city, and this must be considered in changing orifices.—Ed.

Wisconsin

Can you give me some figures on cost comparison between fuel oil and propane? We are figuring a heating job for a new bank building where there will be no other appliances except a gas-fired hot air blower type furnace. We are figuring gas at 14 cents per gal. The bid on fuel oil we know is 15 cents per gal.

The contractor who is putting in the furnace says it makes no difference to him whether he puts in a gas furnace or oil furnace. The oil furnace, of course, will be equipped with a gun.

The bank managers would rather use propane if the cost of operation will come out reasonably close. You probably have figures on average oil efficiencies throughout the country, and propane furnaces are supposed to be rated at 80%; however, I question this.

I would also like some figures on cost comparison between 550 Btu manufactured gas and propane. According to some figures on heating a garage for January, the gas bill read 1600 cu. ft. for \$133.75. It seems to me the gas company must drop two digits for easier figuring and the cubic feet consumed must have been 160,000 cu. ft.

C.E.F.

Because of the difference in heating value between L. P. gas and fuel oil, it is necessary to make the comparison on a common basis. This is often done on the basis of 1 million Btu (10 therms) heat content. It should be on the basis of heat delivered to the heated space so that the efficiency of the heater may be included in the calculation.

Certain factors must be established before starting. The efficiency of a gas-fired space heater, properly adjusted, is between 75 and 80%. Seventy-seven percent may be used as a fair figure. The efficiency of oil-burning units is lower; 65 to 70% are

fair figures, and in this example 67% will be used.

The heating value of propane is about 92,000 Btu per gallon, while the heating value of fuel oil for space heaters is about 135,000 Btu per gallon. The following calculations establish the cost of fuel only per 1 million Btu delivered by the heating appliance.

Oil heat:

$$\begin{array}{l} 1 \text{ million Btu} \\ 135,000 \text{ Btu/gal.} \times .67 \text{ (67\% efficiency)} \\ \times .15 \text{ (cost of oil/gal.)} = \$1.66 \end{array}$$

L. P. gas heat:

$$\begin{array}{l} 1 \text{ million Btu} \\ 92,000 \times .77 \end{array} \times .14 = \$1.98$$

The above figures compare fuel price only and do not take into consideration power costs for oil burner operation, repair and maintenance costs for oil-burning equipment, cleanliness, etc.

The "Bottled Gas Manual," published by us, contains an entire chapter devoted to L. P. gas versus oil, its costs, advantages, etc.—Ed.

New York

In the April 1952 issue of Butane-Propane News there appeared an article entitled "Cylinder Retest Period Extended" related to the new retest periods for L. P. gas cylinders in service.

As the information would be valuable to us, we are interested in the official publication of the Interstate Commerce Commission Regulations on the subject dated Feb. 8, 1952, authorizing to two years the retest period on L. P. gas cylinders.

Also, we would appreciate that you advise us whether or not you have available information with reference to "Water Jacket Hydrostatic Test" and "Proof Pressure" for L. P. gas cylinders indicating if, when cylinders are retested after the 10 or 12 first years of service, it would be necessary to make tests on their permanent volumetric expansion besides those already mentioned.

R.M.G.

The official publication of the Interstate Commerce Commission Regulations is "Agent H. A. Campbell's Tariff No. 8 Publishing ICC Regulations for Transportation of Explosives and Other Dangerous Articles by Land and Water..." The address is: H. A. Campbell, Agent, 30 Vesey St., New York 7.

The Compressed Gas Association publishes the following pamphlet, which we believe will be helpful to you: "C-1—Methods for Hydrostatic Testing of Compressed Gas Cylinders." It can be obtained from the association at 11 West 42nd St., New York 36.

The Liquefied Petroleum Gas Association, 11 S. La Salle St., Chicago, also can furnish information on your problem.—Ed.

LP GAS

Modern, conveniently located plants . . . sound business integrity . . . top quality products, always "on spec" . . . and trained technical personnel to help with *your* problems . . . Be "SURE" — and specify an LP-Gas which is . . .

Always
AVAILABLE



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STANOLIND
Oil and Gas Company

LP GAS SALES • STANOLIND BUILDING
P. O. BOX 591, TULSA, OKLAHOMA





Editorial Comment

SALES OF GAS BY UTILITIES and pipelines in 1956 are expected to total about 71.6 billion therms, an increase of 33.1% over the actual sales of 53.8 billion in 1952, according to an estimate recently published by the American Gas Assn. in a report entitled "Gas Requirements and Supplies of the Gas Utility and Pipeline Industry."

Anticipated 1956 space heating demand will exceed the 1952 requirements by approximately 55%. This is the largest relative gain foreseen in any class of service. Acceptance of gas for space heating is growing rapidly in northern areas under the impetus of pipeline expansion programs. This trend will be reflected in increased demand for L. P. gas for space heating, particularly in areas adjacent to the utility service. It calls for planning ahead, and particularly for extension of the "adequate customer storage" program of our industry.

HOW MUCH CAN ONE ACCIDENT COST? We do not know. But one claim, resulting after one truck, in one accident, struck one man, recently resulted in an out-of-court settlement for \$360,000. This is said to have been the highest accident payment in motor vehicle history. A tank truck loaded with oil, operating at night, recently ran down a pick-up halted on the highway by a previous accident. The crash broke the pick-up driver's neck. He is paralyzed from the neck down, unable to move his arms or legs. Medical men say he may live for 20 years, but will spend the rest of his life in bed, helpless. Never has there been a case that emphasized more forcefully the need for perfect maintenance of vehicles, alert driving, and adequate insurance.

THE OIL HEATING INDUSTRY, through the Oil-Heat Institute of America, has developed and produced an integrated advertising, sales promotion and merchandising program for the use of industry members in combatting the spread of heating by other fuels, notably utility gas and L. P. gas. Much of the promotional material is beamed directly at the alleged superiority and greater safety of oil as heating fuel. While the concept of the program is defensive, there is nothing defensive about the materials that are being made available for the oil distributors. They are fighting without gloves. In case you are in doubt, that makes two strong industries with offensives aligned against L. P. gas for the rural business. The days when we could win by coasting are gone. In the present era of competitive selling, we can only gain ground by better competitive selling.

Ed.

To help you "SELL MORE in 54"...

JOHN WOOD GIVES YOU

All this AND Mrs. America TOO!



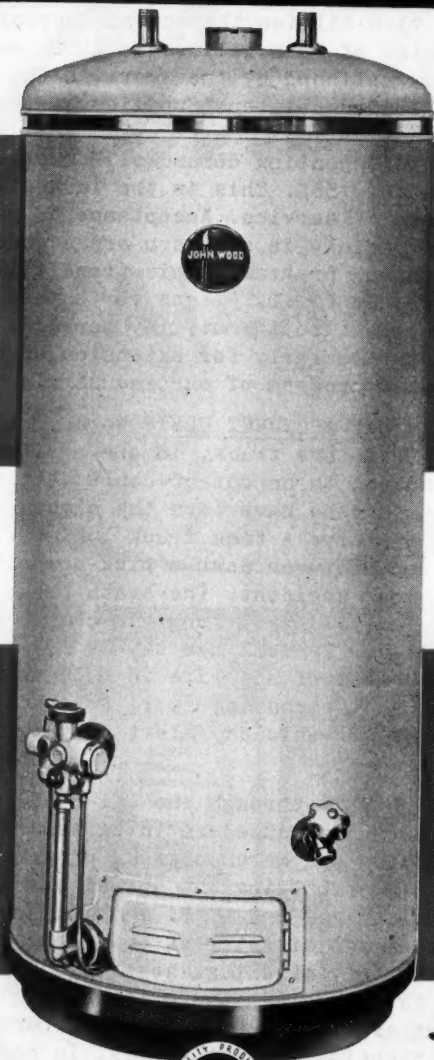
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a complete
line!

NOW—
both galvanized
and glass-lined!

NOW—
biggest promotion
campaign, ever!

NOW—
models for every
sales situation!

The choice of
Mrs. America



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ASK THE JOHN WOOD MAN ABOUT THE **Mrs. America** PROMOTION PACKAGE!

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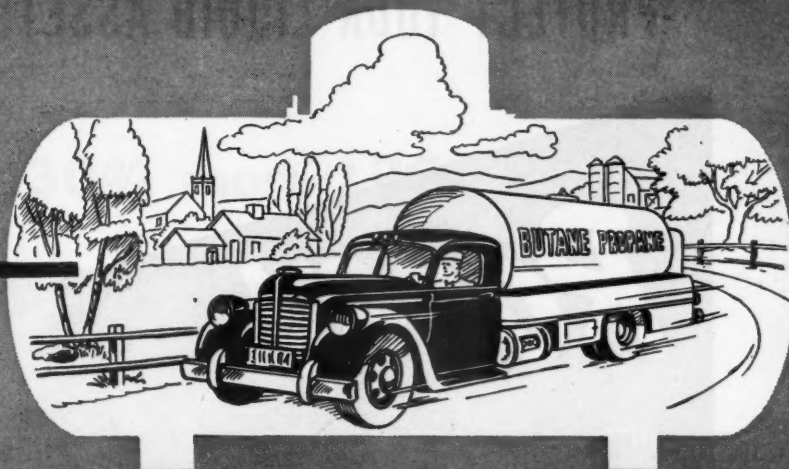
PENFIELD
DUAL-
ACTION



PENFIELD
TABLE-
TOP



BEYOND THE MAINS



Thank You, Boss!

It is a common saying in publication offices that the editor is never sure he has any readers until he prints a mistake. Generally speaking, that is almost true. But these last few weeks have been an exception in our office. We have not only received a flood of Christmas greetings, but also numerous letters and telephone calls commenting favorably on what we have been doing in the magazine. This is not only unusual — it is highly gratifying.

Most of these pats on the back have been directed personally to the editor, as if he were solely responsible for what goes into our pages. But our business is like yours in this important respect — no major undertaking is carried through to success without a high degree of teamwork. No matter whose name is under the title of an article, from three to six people in the editorial office have done responsible work in getting it ready for your perusal. It's a case of "we, not me," and for your kind words WE thank you.

Let's pursue this "we" thought a little farther. If an industry magazine does its job, it deals largely in knowledge and information that is the result of experience in the industry. This is what we have been trying to give you — the voice of experience. This is what has drawn the most favorable comment.

What was the source of this experience? Let's be honest. It was not born at an editorial desk. Only our technical editor, Lester Luxon, has ever been connected with an L. P. gas operation. He is a leading engineer in the industry, busy all day at his regular job. His work with us is principally answering reader's technical questions and keeping the rest of us from

making technical mistakes. Whence this experience that shows up in our pages?

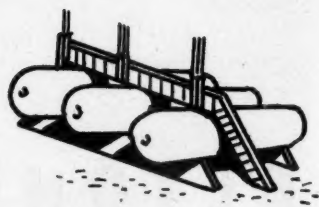
Experience, like gold, is where you find it. No one person has had it all. An industry magazine is primarily a means whereby people within the industry may share their experience for their mutual benefit. You trade experience that you have had for experience that you need but have not had. That makes a magazine like this a cooperative institution. If it is good, you made it possible. There are no geniuses in our office. We can not make something out of nothing. Whatever we present that merits your praise comes from people in the industry, like you, or from people in positions closely related to our industry. If our staff were cut off from your experience, we couldn't possibly print a magazine that you would be interested in reading.

Even an issue like the January number, which consists largely of special reports, originates from your experience. True, much of it is "staff written." But you told us, either through response to similar reports in the past, or by direct suggestion to our staff members, or by replying to editorial surveys, that these were the subjects on which you needed information. The same is true of the Safety Series. Your guidance shows on almost every page of the January issue.

You tell us what to do, and then you help us to do it. That makes you our customers, our editorial associates, and our boss. May we say again, "Thank you, boss?"

Karl Abell

PROTECT YOUR LIQUID ASSETS!



Roney

INTEGRAL FLANGE MOUNTED

RELIEF VALVE AND MANIFOLD

ENGINEERED TO PROVIDE
EXTRA PROTECTION FOR YOUR
BULK PLANT INVESTMENT

EXTRA PORT allows you to shut off, inspect, repair or replace any one valve while other ports provide required pressure relief.

MOUNTING FLANGE INTEGRAL to cast steel manifold simplifies installation and servicing. Bolts to tank flange. Eliminates threaded connection.

TESTING CONVENIENCE . . . Test-opening at base of each port allows valves to be air-pressure tested regularly without removing valve or manifold from service.

EXTRA CAPACITY . . . Enlarged ports assure free flow to relief valves. Roney No. 2113 Relief Valves provide rated flows to 10,500 C.F.M. each — more flow capacity.



RELIEF VALVES are purchased separately from manifold unit. In combination these two products increase the overall efficiency and safety of your bulk plant installation.

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EQUIPMENT AVAILABLE FOR IMMEDIATE SHIPMENT

YOUR COMPLETE SUPPLIER — Manufacturers & Designers of Ammonia & LP Gas Control & Handling Equipment

Delivering 30% more LPG with Two Less Drivers

**Unique "Degree-Day"
Record System Raises
Profits — Lowers Costs**



Pertinent fuel consumption records for each customer are kept in a single Kardex pocket.

By Benedict Kruse

UNDER most circumstances, an L. P. gas distributor in the heart of the Rocky Mountain cold country would have real cause for alarm over a driver leaving the company in mid-winter.

However, when this happened at the Ranchers Gas and Supply Co., Cheyenne, Wyo., during the 1952-53 season the management thought it over a little and decided they could get by comfortably with the remaining help. And, as this was written, Ranchers was planning to go into the 1953-54 season with two drivers less—five instead of seven—than they employed in the fall of 1952.

These economies are part of the benefits made possible through the use of a "degree-day" control system by the Cheyenne distributor. The benefits of this system have been especially marked for Ranchers' Gas and Supply because of the nature of the service this firm renders and of the area it serves.

Ranchers operates its main plant at Cheyenne and a branch at Saratoga, Wyo. The great bulk of its volume is done with ranchers spread out at

healthy distances over the far flung countryside. Some idea of how the distance factor affects this firm's delivery schedules can be seen in the fact that its drivers average only four-and-a-half stops during a full day's work. Each truck clocks in approximately 125 miles a day in making these comparatively few drops.

Another important working condition centers around the fact that a good portion of this firm's customers rely on LPG fuel for both heat and hot water. Other uses include operation of farm implements and trucks, refrigeration, etc.

In recent years, in an attempt to combat skyrocketing labor costs, Ranchers has been conducting a campaign aimed at reducing the number of drops required by each customer in the course of the average year. Even before the degree-day system entered the picture, the firm's sales staff was hard at work on a program to get customers to increase their individual storage facilities. In addition to its other benefits, the records resulting from the "degree-day" system

have also aided this sales campaign.

All records relating to the degree-day control system have, up to this point, been set up and controlled directly by Bert Sheldon, plant manager at Cheyenne. The plan operates roughly as follows:

"Degree-days," just for the record, represent the difference between the average mean temperature for a 24-hour period and 65 degrees. Both the daily and year-to-date "degree-day" figures are reported regularly by the weather bureau.

In applying the "degree-day" system to L. P. gas consumption, the operator establishes a factor for each customer. This figure is divided into the one for elapsed "degree-days" to produce an accurate idea of fuel consumption.

As a general practice at Ranchers, the factor for each customer is developed by taking the figure of the number of gallons used during any given period and dividing it into the accumulated degree days for the same period. Using this system, Sheldon is able to set up a factor starting

with the second delivery to each new customer.

Customer Control Records

Control records for all customers are kept in two Kardex files set up alongside Sheldon's desk. The control is administered by assigning a separate Kardex pocket to house the record of each customer. In each pocket, there are three separate insert forms:

1) Occupying the whole bottom half of the pocket is a five-by-eight-inch card on which Sheldon posts the following information from the delivery ticket shortly after the drop is made: the invoice number, delivery date, percentage reading on the tank gauge, the gallons delivered in the current drop, the gallons delivered to date for the year, the "degree-days" as of the delivery date, and the "degree-day" figure at which the next delivery should be made. A separate column is provided on this form so that Sheldon can adjust the customer's factor, if necessary, on the basis of current experience. An adjustment is almost always made when the customer adds any LPG appliance. In such cases, Sheldon gets a copy of all work orders issued through the service department.

The upper half of the Kardex pocket is divided in half to make room for two four-by-five-inch cards.

2) A ruled form on which Sheldon posts month to month consumption by the customer. Enough space is provided on this form to produce a consumption record for a full 14 years. In this way, the summary card serves as a carry over after the working rec-

ord in the bottom half of the Kardex pocket has been used up and replaced with a new one.

3) A card on which Sheldon lists all appliances or equipment which the customer is operating on L. P. gas.

The Kardex pockets are arranged in overlapping fashion, with information posted in the acetate margins at the bottoms of the pockets immediately visible at any time. As the Ranchers' system is set up, the name and address of the customer are posted on the bottom line of the insert card so that they are constantly visible in the margin of the pocket. In the same margin, there is a pre-printed scale ruled off in squares representing 200 "degree-days" each. With each entry against the account, Sheldon adjusts a colored marker to a position corresponding with the "degree-day" figure at which the customer's tank should next be filled. In this way, he can tell, merely by glancing over the Kardex slides, which customers are due for shipments.

Sheldon checks over these slides periodically, using the Kardex records as the basis for assignment of delivery routes. In preparing these delivery schedules, he takes customer location into account, scheduling the work for the most efficient use of the driver's time.

As this was written, Sheldon was still in the process of planning a more efficient follow-up system which would ease the job of delivery scheduling. The general idea, he felt, was to prepare some sort of slip or card immediately after entering information on one delivery which would serve as an automatic scheduling for

the next drop. This plan, he felt, would serve both to reduce his work volume and to give him a double check to be sure deliveries are made on schedule.

System Aids Sales

As stated earlier, the information accumulated on the "degree-day" record cards has also been of value to the firm's sales department. The accumulated figures have helped salesmen to point out the potential shortcomings of customers whom they felt had insufficient storage facilities. In a country where there is ever-present danger of being cut off or snowed in at any time during almost five months of the year, these comparative storage figures have been a big factor in the success of this sales campaign.

In considering the fact that this firm is now operating with two drivers less than it did two years ago, Sheldon is careful to point out that both the 1951-52 and the 1952-53 winters were relatively mild in terms of their snowfalls, with comparatively few days on which deliveries were hampered. Of course, the effect of the weather on this type of business is a highly speculative matter. However, Sheldon felt that this should be noted so as to avoid misguiding other operators.

At the same time, another contributing factor in the picture is Ranchers' current sales volume as compared with 1951. The firm is doing approximately 30 percent more business today and, as stated earlier, is handling its deliveries with two drivers less than it required then.



On the basis of these records, delivery routes are worked out with drivers to help them achieve maximum productivity.



Bert Sheldon, plant manager, keeps "degree-day" records alongside his desk so that close supervision and control may be maintained.

These Little Pigs Go To Market Early Because of LPG

Midwinter farrowing brings hogs into market ahead of the fall slump in prices.



"Pigs in comfort" at Kay Stevenson farm, Jan. 3, 1954. No guard rails are necessary to keep this sow from lying on her pigs—they do not crowd under her to keep warm.

By Dean Simonsen and Gary Crouch

IN THE midwest most pigs are farrowed in the spring and marketed in the fall when prices are the lowest. To get ahead of this market break, many hog raisers are attempting to farrow earlier pigs. The problems of winter and early spring farrowing are heat and moisture.

A number of methods such as heat lamps, pig brooders, and farrowing crates are in use. Those farmers who

have tried propane for heating farrowing houses like it for a number of reasons.

One of the biggest reasons is that propane heat is completely automatic. Sows can farrow without any attention day or night. If a pig strays off into a corner he won't chill or freeze to death. You can save one to three more pigs per litter by having heated farrowing houses. Pigs chill when the temperature is below 50°.

Cold pigs are a hazard. When the sow stands to eat or drink the pigs get under her to keep warm. They may be too sluggish to get out of the way when she lies down.

Purdue University Agricultural Experiment Station has shown that 17% more pigs were saved with heated pens. Pigs raised in heated pens also were 1.4 lb. heavier at 56 days of age. Apparently chilling causes a setback which young pigs never overcome.

Adequate heat and ventilation will save enough bedding and labor of cleaning pens to more than pay fuel costs. With heat bulbs, which provide spot warmth only, heat cost will be about the same but the moisture (wet bedding) problem and cleaning expense won't be eliminated. When the entire farrowing house is heated and properly ventilated, it is only necessary to clean pens about twice a week. With other methods during cold weather it is necessary to clean pens every day and sometimes twice a day.

Pigs farrowed and raised in heated houses grow faster. In a few days after farrowing these pigs begin exercising. When they begin to explore their pen, they start learning to eat. Often they will be eating well at 10 days of age while pigs that spend



Outside view of Kay Stevenson farrowing house, with partly filled snow fence for bottom insulation, and 500-gal. trailer-mounted fuel tank, which doubles in summer as portable supply tank for custom tractor operation.

their early life under heat bulbs don't have the chance to develop good appetites as quickly. The sooner pigs learn to eat, the faster they grow, and fast growing pigs are the most profitable.

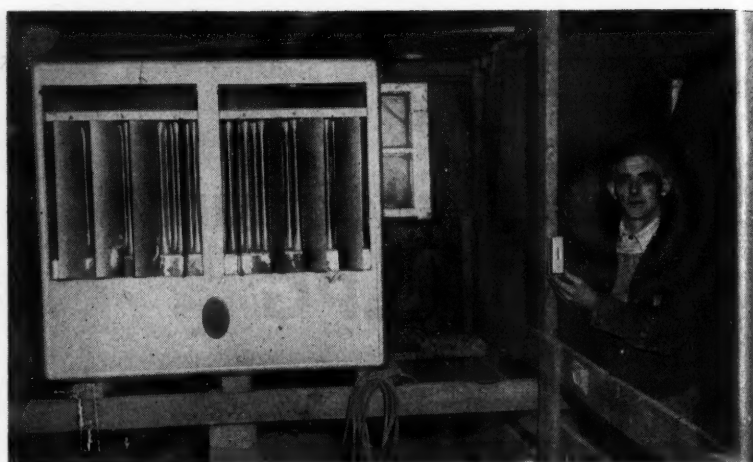
The heating of hog houses with L. P. gas started when one of the stockholders of the Simonsen Propane Service and his tenant started to farrow winter pigs. After attempts to use heat bulbs in combination with a straw loft had ended with a broken bulb that almost burned the hog house down, another idea was tried. In 1950 they remodeled an old horse barn into a 20-pen hog house, insulated it, installed an exhaust fan with time clock controls, and put in two suspended propane space heaters with a total of 165,000 Btu input. This combination was 100% successful, but only the 100,000-Btu heater was needed.

Exhaust Fan Is Answer

During 1951 they again experimented with another old hog house. Two-week-old litters were moved into this unheated house during February. This house, with 12 pens, had been insulated with a straw loft. These pigs soon began to languish because it was impossible to keep the bedding dry even when it was replaced twice a day. Then a noncirculating type space heater was installed. Still the house remained wet. Next a 65,000-Btu input Reznor heater was installed, but the air circulation that the fan on this heater provided still did not solve the problem. A few days later an exhaust fan with a time control was installed. After it had run for 10 minutes, there were drops of water on the fan blades. In three days' time the walls in this house were dry. Eighty-three pigs were saved and grew well from that date on.

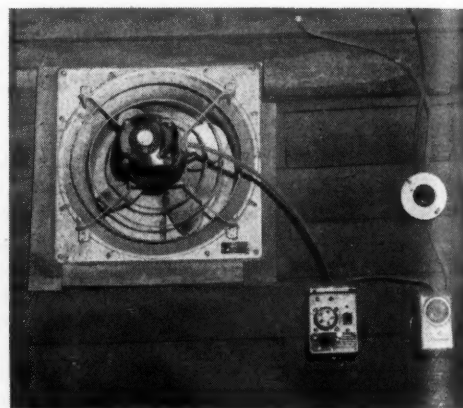
From this experience Simonsen Propane Service has developed the following rules as a guide for installation of farrowing house heating systems:

1. *L. P. gas is very practical and as economical as other types.* Installation can be made quickly without using floor space. Venting is easy. It is practical for farmers to provide their own insulation, if necessary. A straw loft will adequately furnish ceiling insulation. On poor buildings a snow fence around the outside filled



Bryant heater rated at 165,000 Btu provides adequate heat in poorly insulated 18-pen farrowing house on Kay Stevenson farm at Quimby, Iowa. Dale Zupp, herdsman, sets thermostat at 55°. Double aluminum shield above heater protects straw in loft. Fuel consumption, 3 gals. per pig.

Exhaust fan with time clock control (lower right) is as important as the heat. Safety thermostat at left of time clock shuts off the fan if temperature in the house gets down to 45°. The time clock can be set to run the fan any number of minutes in each 10-minute cycle.



with discarded bedding will keep the floor warm.

The outmoded horse barn, which every Iowa farm has, can be equipped the same way and will be an efficient farrowing house.

2. *Insulation is necessary.* It pays to provide double walls and at least 4 in. of insulation in the ceiling. On occasions when permanent insulation is not possible, then install a straw loft. If there are cracks around the foundation, a snow fence filled with straw around the outside keeps the floor warm.

3. *Ventilate.* Install an exhaust fan with time clock control with 10-minute cycles: We have standardized on a 13-in. Jamesway 1750-rpm fan. It is not practical to install a heating system without an exhaust fan. Fresh air and keeping the house dry is as important as heat.

Practical experience shows that if the alleyway floor is wet in the morning, the fan should be set to run another minute or two in each cycle.

4. *Heat.* A permanent insulated type house from our experience should have 5000-Btu input per pen. The straw loft type insulated house should have 9000-Btu input per pen. Heater capacities of these sizes will adequately heat farrowing houses during 20°-below-zero weather. For instance, the L. J. & Stanley Baxter farm has a well insulated 31-pen farrowing house which has only a 100,000-Btu input heater or 3225-Btu input per pen. In cold weather the far end of this house is not warm enough. The Baxters move week-old to two-week-old litters to this end and have gotten by. The Baxters farrow from 1000 to 1500 pigs per year. Their cost for heat is less than 25 cents per pig.



HERE A CHICK – THERE A CHICK EVERYWHERE A CHICK-CHICK

history and development of the LPG Brooder

By A. R. Wood, President

A. R. Wood Manufacturing Co.
Luverne, Minnesota

IT was back in the fall of 1927 that our company set about from scratch to build a gas brooder for propane gas. There were several problems which faced us—first, we had to build a brooder which was economical because at that time propane gas was selling for as high as twelve cents a pound or approximately fifty cents per gallon as compared with an average price of eighteen cents per gallon today.

Our competition would be from electricity selling for one and one-half cents per kilowatt and fuel oil selling for eight cents per gallon.

Secondly, we would have to build a safe brooder, one that wouldn't create a fire hazard or would have the flame extinguished by a gust of wind or by the chicks flying past the burner or pilot.

Third, there was no suitable thermostat control on the market available for brooders; we would have to build our own to suit our requirements.

Fourth, we would have to design a brooder which could be shipped knocked down since shipping it assembled would make an awkward bulky package and be entirely unpractical.

The first gas brooder we made had a single gas burner with a heavy metal disk above it against which the flame played. We used the same type

of a canopy for this gas brooder as we had been using in our electric brooder and placed the disk and burner up in the top of the canopy. This arrangement did not prove very satisfactory since there was too great a concentration of heat under the center of the canopy and not enough out at the edge, and we did not get efficient heat reflection from the metal disc to the floor. In addition to this, dust would collect on top of the disc between broods, when the brooder was not in use, then when it would be lighted again the dust would start to smolder and burn; if flaming particles of it fell to the floor they could cause a fire.

After a number of experiments the disc was finally replaced by porcelain refractories. Still we were unable to attain proper heat distribution on the floor with the single burner.

Studying the uniform heat distribution which was so satisfactory in the electric brooder we tried the idea of using four burners spaced and so arranged as to give the heat against the refractory in much the same manner as in our electric brooders. This design seemed to solve our problem and we adopted it for our standard production models.

Designing an efficient burner was the next and perhaps most important problem. With the assistance of engineers in the industry we worked out and put in production a burner similar to the one now on our brooder, except that it was smaller. Also we designed and put into production the

thermostat control, the same as is used on our brooders today.

In the years that followed we made many minor changes and improvements worked out as a result of many thousands of users making a suggestion here and giving us a new idea there, until we have perfected the appliance as it is today.

It is not the purpose of this talk to discuss the merits of the particular brooder which our company makes, but to cover the story and advantages of gas brooders generally. However, since we pioneered the field almost wholly alone for many years and introduced and promoted the sale of L. P. gas brooders from one end of the country to the other, we have no source to turn to for this story than our own experience. I feel that it is important to point out this development and promotional work since it gives the gas appliance salesmen and servicemen some knowledge of the background from which the gas brooder arrived.

I feel that it will be of value to present herewith some of the problems which were faced when this gas brooder was first put on the market, since the industry is still faced in some places with a resistance to the cold room brooding system.

While the electric brooders in the field had shown the way to cold room brooding, they were used by only a small percentage of the poultry men,

**Abstracted from a talk made at the recent Missouri service school.*

History and Development of the LPG Brooder



Chicks remain healthier, develop faster and feather out earlier under "cold room" brooding conditions. L. P. gas provides ideal and economical heat.

the vast majority knew nothing of the operation of cold room brooders and most of them wouldn't have believed such an idea was feasible. Consequently, when the promotion of L. P. gas brooders got under way, the going was slow and rugged. Few farmers had ever heard of L. P. gas and were skeptical about its use, and a gas brooder was entirely new to most of them; moreover, cold room brooding was something they would rather let their neighbor experiment on. If it worked, all right for him; then the prospect might try it.

Selling a brooder is a little different than selling a stove or a water heater, because if anything happens to spoil the cake or roast in the oven of a gas range the housewife is only out whatever she had in the stove to cook, but if a farmer has a hundred dollars worth of chickens under a brooder; or two hundred dollars worth of turkeys under it, and something goes wrong, who is going to pay for his loss? He wants to know for sure that the brooder is okay. He wants to go and see one in operation and find out all about it before he buys it.

It was obvious that it was going to require some spectacular demonstra-

tions to convince the poultryman that this gas brooder was for him.

To put the idea across, we designed a simple rectangular pen 10-ft. x 14-ft. with walls four feet high and a gable roof 7-ft. high at the peak. The side walls were nothing more than a wooden frame made of 1-in. x 4-in. lumber with three-quarter-inch mesh poultry netting fastened to the frame. The end of the pen was made of the same material and one end had a door also made with the poultry netting. Half of the roof toward the front end was covered only with a poultry netting while the back part of the roof above where the brooder stood was made of quarter-inch plywood or other suitable waterproof covering. Actually, except for the area of 7-ft. x 10-ft. which was sheltered by the roof, the entire pen was open to the weather and right on the ground with no floor.

We constructed a number of these pens out in front of our dealer's place of business, where space permitted, or at the side of his store or somewhere in his yard so it could be seen by the customers coming in to buy feed or to deliver eggs. Day old chicks were put out under our gas brooders in these outdoor pens dur-

ing January and February and were brooded through the full six weeks. The chicks were usually borrowed from some reliable hatchery nearby. The gas company gladly furnished the fuel for the advertising value, and the feed dealer was pleased to have his product used to show what healthy chickens could be grown with it. All in all the plan worked well. The chicks grew faster, feathered out better, took on more weight, had less disease and sickness than chicks brooded in the average hot room brooder house. And, many prospects for brooders wanted the plan for the outdoor pen so that they could brood their chicks out of doors just as was done in the demonstration. However, we advised them to use their regular brooder house, but to open the windows and provide cross room ventilation so that there would be plenty of fresh air. They would get the same results in a well ventilated brooder house that we obtained with our outdoor demonstration.

Much publicity was given to these outdoor demonstrations. Photographs were shown in many magazines and periodicals and several articles were written up on the idea of cold room brooding and its advantages.

Price of LPG Reduced

The price of L. P. gas was gradually coming down and could be had for as low as six cents a pound or 25 cents a gallon for brooding. All L. P. gas at that time was delivered in 100-pound cylinders. With the price being reduced and gas more readily available in outlying areas, brooding with L. P. gas really began to take hold.

In the early thirties inquiries began to come in from the eastern and middle western states, and soon shipments were being made regularly to many dealers in those areas. This ultimately lead to the establishment of a midwest factory which now supplies the states east of the Rocky Mountains.

It was necessary to put on the same kind of a demonstration campaign in the eastern and midwest states that had been used so successfully on the west coast. Over a period of several years we showed our dealers how to



put on the same demonstration, and they achieved the same good results as we had experienced with our west coast demonstrations.

LPG Brooder Leads

The L. P. gas brooder today outsells all other brooders using other kinds of fuel, yet there are still many more chicks brooded in hot rooms than in cold rooms, because there are many old brooders still in use. Most poultrymen seem to want to wear out their old style coal or oil brooder before they purchase a new modern L. P. gas brooder.

When a farmer or a poultryman or a turkey grower goes in to purchase a brooder there are certain requirements which he wants that brooder to meet—certain specifications, let us say.

First, he wants a brooder that is safe, free from any possibility of starting a fire or of going out in the night and chilling the chicks—free from possible danger of any kind.

Second, he wants a brooder which is economical to operate. With egg profits and broiler profits getting smaller and smaller each year, the difference of a cent and a half or two cents per bird in the cost of brooding fuels may well represent fifteen to twenty percent of his profit on a flock of broilers.

Third, he wants a dependable brooder, one which supplies the heat day in and day out without a lot of worry and fuss, one that the wind can't blow out, and a brooder that holds the temperature accurately and consistently.

Fourth, he wants a brooder which is simple and easy to operate which requires little attention, is easy to clean, and adjust. He cannot afford to waste time bothering with an undependable hard to regulate thermostat control, or hard to get at burners to be cleaned.

Fifth, the customer as well as the dealer wants a brooder which is easy to assemble with few bolts and screws, few connections to make. Often the dealer undertakes to assemble the brooder as part of the sale agreement, and the simpler the brooder is to assemble the less expense the dealer is put to. It must be

borne in mind that the poultryman doesn't buy just one brooder, he often buys ten or fifty or perhaps a hundred brooders. Many poultrymen using L. P. gas brooders operate as many as two hundred at a time, so any saving in assembling the brooder is an important factor.

Sixth, and last, but not least, the customer wants a durable brooder, one that will give him years of care-free service without having to replace this part or that part every year or two. He wants a unit that he can put away in the spring when he is through brooding his pullets or turkey poults, and when next brooding season comes he can put it back in the brooder room and know it will be ready to go.

Comparison of Brooders

In the light of these six requirements, the poultryman has asked for, let us now compare the L. P. gas brooder with a coal brooder, an oil burning brooder, an electric brooder, a hot water system and a radiant floor heat brooder system. First in the matter of safety, the absence of a fire hazard. A coal brooder must be very carefully cared for to avoid the possibility of a brooder house fire, smouldering ashes rolling out over the litter on the floor create a definite fire hazard. A hole burned through the stove wall can let live coals fall out on the floor. A defective stove pipe or defective draft regulator can be sources of danger. A coal brooder cannot be classed as a safe brooder.

An oil burning brooder is notorious as an arsonist. More brooder house fires are started by oil burning brooder stoves than all other types of brooders combined. The heating drum burns out or the overflow pipe which is supposed to drain off any excess fuel oil when it gets above a certain level in the burner may get clogged up. Oil will then spill out on the floor and can easily be ignited from the brooder. Leaky pipe connections from the oil tank to the brooder, or a leaky oil tank itself all are sources of danger. Both the fuel tank and the stove can easily be knocked over. The oil brooder gets a low mark of safety.

The electric brooder rates high in

the matter of safety, although careless handling may cause a short either in the exposed element heating wire or the connecting wires.

The hot water system and the radiant floor heat system are very safe because the source of heat is enclosed in a standard boiler and is usually outside of the brooder room.

The L. P. gas brooder, properly engineered and constructed, rates high in safety. There are some 250 to 300 thousand of our own make of brooders in use throughout the country, and our company has yet to learn of a fire in a brooder caused by any defect or faulty part of the brooder. There may have been some fires, but none were ever reported to us.

The burners are high up above the floor; the Btu input is relatively small. Burners and refractories are rigidly attached to supporting diaphragms; there are no parts to burn out, no vent pipes to rust or burn out, no oil to spill, no ashes or hot coals to fall onto the floor.

A well designed L. P. gas brooder rates very high in the matter of safety.

Economy High on List

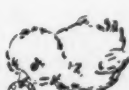
The next requirement on the list is economy.

The coal brooder requires about a ton of coal to brood 500 chicks through the brooding period. The cost is about \$18.00 or 3 and 3/5 cents per chick. These figures are based upon operation in cold winter months.

A fuel oil brooder will use about 100 gallons of oil to brood 500 chicks at 15¢ per gallon and will average 3¢ per chick.

An electric brooder will use about 500 kilowatts to brood out 500 chicks at a cost of 2½ cents per K.W.; or 2½ cents per chick.

A hot water system figures on the average about 2 and ¾ cents per chick. A radiant floor heat system will figure somewhat higher. Both of these last two items will vary according to the kind of fuel used to heat the boiler, so it is not advisable to attempt to establish an accurate cost. But since they are both hot room systems, they will use between three



History and Development of the LPG Brooder

and four times as many Btu's of heat as the cold room brooder.

The L. P. gas brooder, five hundred chick size, will use about 25 gallons, possibly 30, at the most, for an entire brooding period. These figures are figures which have been established by our brooder over many years and from many users in various parts of the country. The consumption of gas, however, varies greatly between different makes of brooders. Estimating the average cost of propane at 18 cents per gallon, the brooding cost for gas would be between four and a half to five dollars and 40 cents per brood, or approximately one cent per chick.

So, on the score of economy, a well designed gas brooder provides the cheapest method of brooding chicks of the above costs.

The third requirement we stated was dependability and accuracy of temperature control. A coal brooder is dependable as long as it has coal inside of it, has no burned out parts and the chimney is sound. The brooder temperature, however, will fluctuate ten or fifteen degrees, as the outside temperature changes.

The temperature control consists of two double wafer ether thermostats which, on the coal brooder, open and close a draft diverter in the top of the stove. The control is not entirely dependable since it will sometimes get clogged up with foreign matter and stick.

The oil brooder is dependable as long as there is no high wind to blow down the chimney and put it out. As long as the overflow pipe is clear and it has a supply of oil and there are no leaks anywhere and the chimney is solid. The thermostat consists of a double ether wafer which actuates on oil drip value. The temperature fluctuation varies from eight to twelve degrees.

The electric brooder is dependable as long as there is no interruption of current and as long as none of the heating elements are burned out or shorted, and all the wiring is intact.

The temperature of the electric brooder can be controlled very accu-

ately on a well designed electric brooder to within two degrees or so.

The hot water system and radiant heat floor system are dependable as long as fuel is supplied to their boilers and electric current is available to operate the pump which circulates the water.

The temperature can be controlled to within five or six degrees by a thermostat which regulates the flow of water through the pipes.

The gas brooder has proven to be the most dependable of all brooding systems available at the present time. It will provide heat for the chicks until it empties the gas tank and could take a long time. By installing two regulators on the system so in case one should freeze up, the other will automatically take over, the possibility of an interruption in the gas flow is greatly reduced.

The burners of a brooder designed with multi burners and multi pilots connected with a flash tube system can hardly be blown out. Neither the wind or the checks can extinguish the flame; if one burner happens to be flicked out by a chick flying across the brooder it will be immediately relighted from the burner next to it.

The temperature can be maintained to within a degree variation under the canopy with a good gas brooder thermostat control, even though the room temperature fluctuates as much as 50 degrees.

So from the standpoint of dependability and accuracy of control the gas brooder rates number one; it is without even a close runner up.

The fourth specification the customer wants is simplicity and ease of operation. Let's see how the brooders stack up in this respect.

The coal brooder has to be fed two or three times a day and ashes have to be removed, draft control has to be checked, and the stove has to be lighted each night during warm weather. Since to maintain even a small fire in the brooder during warm days runs the temperature in the brooder house up much too high and wastes fuel the oil brooder has to be

kept supplied with oil. The oil tank which comes with the stove holds about five gallons and requires filling every day in cold weather. The overflow pipe has to be kept clean, and the burner cleaned of soot each day. This process is usually accomplished by turning a handle which projects from the top at the center of the brooder. During stormy weather the brooder has to be checked frequently because a sudden gust of wind will often extinguish the flame.

In the spring, during warm days, the brooder has to be turned out and then lighted again in the evening, or if there is danger of a sudden drop in temperature during the day, someone must be around to light the brooders. If the brooder is left running during the warm days it not only wastes fuel but heats the brooder house too warm for the comfort of the chick.

The electric brooder is simple to operate: plug it in, regulate the temperature, and it needs little attention other than to reduce the temperature a couple of times a week as the chicks grow larger and stronger and feather out.

The hot water system and radiant heat floor system require attention at the boiler; how much attention depends upon the kind of fuel used to heat the units.

The hot water system is hard to keep clean under the platform and pipes and requires more attention than the radiant floor heat.

The gas brooder compares most favorably again in the matter of simplicity and ease of operation; light the burner once at the beginning of the brood, adjust the brooder to the proper temperature and twice a week turn the heat down about two or three degrees each time, clean the burner after each brooding season. There are no ashes to empty, no coal to carry, no oil tanks to fill, no soot to clean out, no smoke, no dirt and no overflow pipe to clean. The care of a brooder couldn't be much simpler.

The fifth requirement we pointed out was simplicity of construction



and ease of assembly. It must be remembered that many operators, especially those who raise turkeys only and who raise pullets for egg production, use their brooders for one, or at the most, two broods in the spring, and that they usually move them out of the brooder house when they have completed the brooding. The hot water system and radiant floor heat system are permanent installations and are not removed from the brooder house.

It is quite a job to move a coal burning brooder and to set it up. First a brick or sand platform has to be put down on top of the floor for the stove to stand on. This is elevated above the room floor a few inches in order to keep the litter away from the stove. A sheet metal canopy is then placed on top of the stove and a chimney is installed to carry the smoke out through the roof.

These parts have all to be handled and stored each time the brooder is dismantled or set up.

The fuel oil brooder stove presents about the same problem in handling. The chimney has to be put up and removed each time the brooder is assembled. The separate canopy and drum stove have to be handled, and the fuel tank and tank stand have to be set up. The thermostat has to be connected in the fuel line and piped to the brooder, and the overflow pipe has to be connected and run outside the brooder house. These connections have to be made leakproof.

If a turkey grower is operating fifty brooders, it means several days work to get the brooding equipment ready to use.

The electric brooder is much easier to handle. Many of them come already assembled from the factory ready to plug in. They are all in one single unit and can be easily moved in and out of the brooder house. Some electric brooders are shipped knocked down and the first assembly may take a little time, but once they are assembled it is not necessary ever to disassemble them again. Many electric brooders are equipped with

a hanger and with ropes and pulleys so that they can be raised to the ceiling of the brooder room and left there between broods.

Most of the gas brooders being manufactured today come knocked down and must be assembled either by the dealer or by the customer. The amount of labor involved varies greatly between different makes of brooders. Some brooders have over a hundred bolts and screws that have to be put in to assemble the brooders; others have only eighteen. Some gas brooders have several rather delicate gas connections to make with copper tubing and small brass fittings; others use standard one-eighth inch galvanized iron pipe and fittings. However, once assembled, the gas brooder doesn't have to be dismantled to be moved in and out of the brooder house. The only connection which has to be broken is the hose connection where it attaches to the supply pipe.

The gas brooder, like the electric, is all one unit with the burner assembly. Canopy and legs are all fastened together in one unit and can either be raised to the ceiling with ropes and hanger provided with the brooder, or carried to a store room. So again, when it comes to simplicity of assembly and ease of moving and storing, the better designed gas brooders rate most satisfactory.

Now the last but not least requirement on the list, the purchaser wants

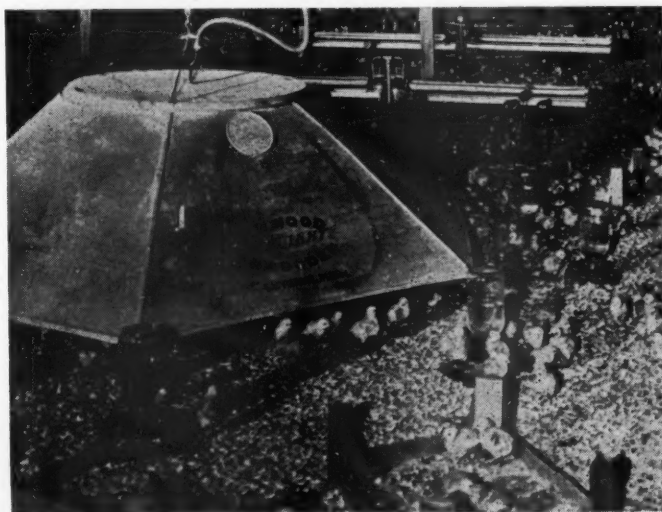
durability and low upkeep cost. Brooder repairs are a nuisance, not only because of the expense, but because the poultryman puts them away when he is through with them and forgets about the little part that may be lost or broken, then when brooding season comes around, he usually starts to get the brooders ready the day before the chicks are coming, and if a part is missing or broken, he hasn't time to send to the factory for it before the chicks arrive.

The average life of a coal brooder stove is about six or seven years. In the meantime, perhaps the grate has to be replaced twice, the chimney may have to have a section or two replaced, and the thermostat wafers may need replacing three or four times in the life of the coal brooders.

The average life of an oil brooder is from three to five years. Usually the heater drum burns out within that time. The thermostat value may become inoperative during the life of the brooder and need replacing, and the thermostat wafer will need to be replaced two or three times in the three to five years, and a chimney section just above the heater drum may have to be replaced, since it is apt to burn through.

The electric brooder is much longer lived than either of the above units. Many electric brooders made twenty-five years ago are still in use giving good service and have required no repairs other than a new ether ther-

Fire hazards due to the presence of dry litter are eliminated when brooding with L. P. gas.



mostat wafer occasionally, or perhaps a burned out element or two within that time.

The hot water and radiant floor heat systems are as durable as the boiler and pump which heats and circulates the water. They are comparatively new, and I do not have any figures on their estimated life, but they should give long trouble-free service.

The gas brooder lasts a long time, in fact sometimes we think they last too long because many of those which our company manufactured and sold over twenty years ago are still in service, have been used every year since they were purchased, and are giving just as good service as they did when they were new.

There is nothing on a well designed and carefully manufactured gas brooder to wear out, rust or burn out. There is no reason why they should not last thirty or forty years with good care and reasonable treatment. The burners don't wear out, the refractories do not burn out, the pipes do not rust or deteriorate. Perhaps it may be necessary to replace the hose, and a new thermostat wafer may have to be installed occasionally, but other than that, unless some parts of the brooder are broken by accident or carelessness, there should be no wear-out to them.

I know of one installation of one hundred and twenty of our gas brooders which were sold to a California poultry establishment just twenty years ago this spring; they have been used regularly since they were first installed, and in the twenty years, I doubt that the upkeep expense has averaged fifty cents per brooder for the whole twenty years, outside of the replacement of the ether wafers, so on the score of durability and low upkeep cost, the gas brooder is right at the top again.

The proof of all the information which I have presented in this discussion is born out by the fact that more and more poultrymen are turning to L. P. gas brooders as a solution to their brooding problems. Last year there were more L. P. gas brooders sold than all other types of brooders combined, and a still greater proportion of gas brooders is being sold this year. The L. P. gas brooder is not only here to stay, it is here to replace eighty percent of all the brooding equipment now in use and that covers several million brooders.

Deodorizing LPG Tanks Is Easy With This Method



What to do with tanks that must be retired from service is coming to be a serious problem in several areas, particularly where propane service is replacing butane, and where underground tanks are reaching the time when they must be replaced. The main "gimmick" for making them saleable for other uses has always been how to remove the odor and flavor of the L. P. gas odorant.

Structurally, they are suitable for moderate pressure water systems. Many operators have tried using them in this service, but the lingering odorant has produced enough contaminant to make the water unpalatable to humans, livestock, and poultry.

At a recent gathering of LPG distributors in Fresno, Calif., this subject was mentioned casually after the main business of the meeting had been disposed of. Two distributors, L. M. Rose of Marysville, and Dominich Campora of Stockton, seemed surprised. Both had been cleaning old butane tanks and putting them in water storage service with satisfactory results for a long time. Oddly,

each had arrived at his own answer to the problem independently of the other, and the answer was the same—tri-sodium phosphate, known in the chemical industry as "TSP." The job can be done most expeditiously with a steam cleaner, putting the TSP instead of the customary soap compound into the cleaner.

Mr. Rose's procedure is to put 2 lb of TSP through the steam cleaner for each 100 gal. capacity of the tank to be cleaned. Mr. Campora goes a little more into detail with the following table:

Tank Capacity	TSP Required	Steaming Time
100 gal.	5 lb	2 hr.
250 gal.	8 lb	2½ hr.
500 gal.	12½ lb	3 hr.
1000 gal.	20 lb	4 hr.

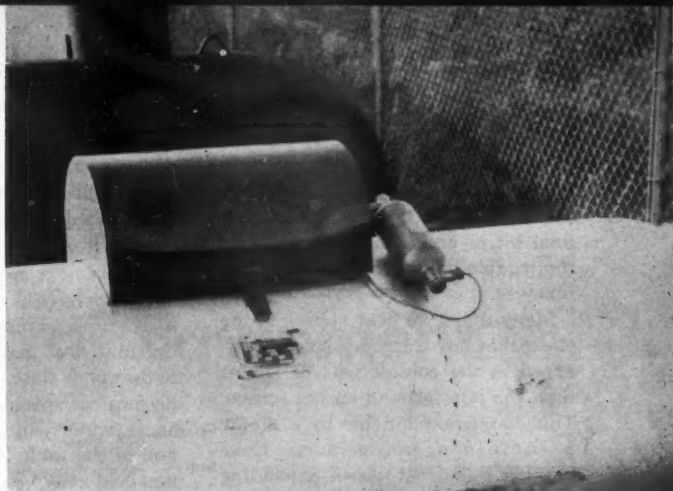
After the steaming is complete, the tank is filled with either hot or cold water and thoroughly rinsed out. The TSP has high solubility, so the residue cleans out quite readily. Traces of the chemical lingering in the tank are not objectionable.

Steaming is only practical when the tank can be brought to the steam cleaner. Where the cost of transporting the tank could be an important factor, it may be cleaned right where it sits by increasing the quantity of chemical to 4 lb per 100 gal. capacity of the tank to be cleaned, filling the tank with water, and allowing it to sit and soak for a day or two. Mr. Rose recommends mixing the TSP in a bucket and bleeding it into the tank with the water in order to get a thorough mixture so all parts of the tank will receive a uniform solution.

Tri-sodium phosphate is a widely known industrial chemical. It is used extensively in the metal industries, and for cleaning paint. It is one of our most effective degreasing agents. Painters frequently use it for repainting jobs, washing the surface film off with TSP solution so the new paint will stick. It is available from any industrial chemical company, most dealers in agricultural chemicals, and every paint store. The cost is low, averaging from 12 to 15 cents per pound in moderate quantities.

Moisture Removers Prevent Regulator Freeze-Ups

By A. H. Fine
General Manager
Fine Products Co.



125-cu. in. moisture remover installed on 1000-gal. tank at an industrial heat treating plant. Regulator mounted beneath hood.

THE cause of regulator freeze-ups is one of the oldest and simplest of physical reactions. Yet in the L. P. gas field it is probably the most controversial and buck-passing subject we have every year. It goes on and on with everyone venturing an opinion and no one accepting the blame.

Truthfully, the regulator manufacturer and the tank manufacturer who receive most of the blame for regulator freeze-ups have reason to take this attitude.

During the "shortage" years we heard of carloads of tanks delivered with 15-25 gal. of water in each tank and the dealer so angered about it that he actually billed back the fabricator for the "watered" freight—but these were rush and non-competitive years. Today we believe all tank fabricators are, by choice or necessity, making a conscientious effort to dehydrate their tanks.

As far as regulator manufacturers are concerned, they never were responsible for regulators freezing. They don't freeze. It's the moisture that goes through them that freezes. L. P. gas *won't* freeze.

The principle that causes regulators to freeze is much older than the L. P. gas industry. It is the same problem mechanical refrigeration engineers have been combatting since the advent of low pressure refrigerant. This is simply "moisture," regardless of its origin. Refrigeration engineers assemble sealed units in dehydrated rooms, use baked-out parts, dehydrated tubing and moisture-free refrigerants, and still end up with troublesome percentages of "freeze-ups" at their expansion

valves. Why? Simply because somewhere, in spite of all precautions, there appears "moisture." How much? Probably not much more than it takes to lick a postage stamp. Where did it come from? Truthfully, no one ever knows, because today it might come from a loose flare nut—tomorrow from vapor trapped in the fine pores of the metal finish or the next day from the compression of humid air—and the following day from moisture in the refrigerant.

After spending thousands of dollars on bake ovens and dehumidifying equipment the end result has always been and still is *insert a dehydrator*. Why? Because it will pick up that small amount of moisture which might be accumulated from all of the other sources. Where do we insert this unit? Naturally, right ahead of the point where we expect the freeze-up. In refrigeration it is the expansion valve; in L. P. gas it is the regulator, because here is the only place protection from all of the various possible sources of moisture can be assured. Does the use of a dehydrator in refrigeration or a moisture remover in L. P. gas mean we can then be careless about moisture in the various assembled parts? Certainly not. Capacities of moisture removers and dehydrators are very limited. They can only protect against those unseen and otherwise unremoved moisture sources.

When refrigeration manufacturers assembling units in air conditioned factories with controlled humidity and available bake ovens still require the use of dehydrators to protect against moisture, is it reasonable to think an L. P. gas dealer can install

a unit consisting of a 500-gal. tank, 50 ft. of tubing, etc., out in the open, on a day with 80% humidity, without having moisture problems? Very unreasonable, I would say.

Let's give the tank manufacturer the benefit of the doubt; let's assume he delivers a dry tank, and the refinery delivers dry gas; and we'll buy dehydrated tubing to connect up the job. For good measure, let's say the regulator is trouble free. Now we have eliminated the most accused sources of moisture troubles, so let's examine what's left.

First of all, the tank wasn't delivered with L. P. gas in it; there must be something in it. What can this be? Air, which probably contains 60-90% humidity. What happens to this when L. P. gas is admitted to the tank? It is compressed, squeezed like a sponge, so that vapor humidity becomes liquid. Already, we have located one source of moisture.

Next, consider the dry product entering the tank car or bulk truck at the refinery. The truck or tank car has just returned from some bulk plant where the unloading was done by a vapor return (circulating) system. Isn't it possible that moisture accumulated over years of operation might have been transferred to the tank car or truck?

Most certainly we need the tank fabricator to exercise every possible precaution to deliver a dry tank. Most certainly we need the refinery to continue to use every precaution to deliver dry gas. Most certainly we need the regulator manufacturer to continue to develop regulators with proper balance and large orifices to decrease freeze-ups. But still, let's

allow for an occasional error on the part of one of these, add to this the possible accumulations of moisture from uncontrolled sources, and we immediately see the need for the last final bit of protection just ahead of the trouble point. This is a moisture remover.

Many times we hear stories to the effect that less freeze-ups are experienced in the coldest part of winter than the late fall and spring season. This, too, is explainable by a simple principle of refrigeration. Compressed liquids or gases expanding through an orifice absorb heat. In a refrigerator this heat is absorbed in the coils around the ice cube trays. The heat is taken away from the water in your trays and you get ice cubes. The same occurs at the orifice in a regulator. The orifice separates the high-pressure L. P. gas from the low pressure side of the regulator. When the orifice is open the expanding gas absorbs the heat from the orifice and regulator body. The following table will demonstrate this to be a lot more than most of us realize. In other words, with a propane tank temperature of 120° F. and our regulator delivering maximum load, the orifice temperature is 60° F. No freezing temperature here, so no harm is done. (See chart below).

However, when the propane tank temperature gets down to 60° F., note our orifice temperature is 30°, i.e., 2° below freezing. However, we are not going to realize much difficulty even here, but then the next step is the trouble maker. When that propane tank temperature gets down to 40° F., Mom decides its time to cook and bake, Sis decides to kickup the thermostat and the heat load is on. The regulator is standing practically open, the expanding gas absorbs the heat from the orifice, and even though the outside temperature at 40° is 8° above freezing, our orifice

temperature goes to 18° F., i.e., 14° below freezing; right there is our critical temperature. Any moisture coming through that cold orifice will be grabbed like your tongue grabs onto an iron pipe at zero.

Go the next step further and you might not have as much trouble. With 20° F. tank temperature, moisture in the tank has less tendency to stay in the vapor state. In the liquid state, because of specific gravity differences, water will separate to the bottom of the tank. With the tank bottom cold at 20° F., it will in all probability freeze and eliminate itself as a freeze-up problem. The colder it gets, the less of a problem it becomes.

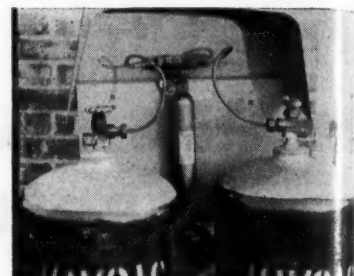
Although the above explains the reasons for the greatest number of freeze-ups occurring during the outside temperature range of 40°-20° F., we cannot eliminate positively the freeze-up possibilities at lower temperatures.

The chart below also answers another very common question which is, "Why do I get freeze-ups on bulk installations when I do not get them on cylinder installations using the same propane?"

May Not Be Moisture

It could very easily be assumed the reason is that the bulk tank contains moisture. In most instances this is not the answer, although it has already been pointed out that the field assembly of the bulk system does offer more opportunity of introducing moisture.

From the chart below we can see that at the "critical temperature" the regulator orifice becomes colder than the liquid gas being delivered to it. This is based on the premise that the regulator is operating at maximum capacity. Now, if we think a little further, we realize that bulk systems are installed at those installations



Moisture remover mounted between manifold check and regulator on cylinder installation by Kay Gas Co., Chicago.

having more load, i.e., heavier withdrawals. The cylinder installation generally is operating on minimum load requirements. Therefore, on a cylinder installation the chances are the regulator is not drawing sufficient gas at any one time to refrigerate the orifice much below the temperature of the tank. However, because the bulk system was installed to provide for a heavier load, the regulator orifice is open a greater portion of the time. Because of this there is more refrigeration, making a freezing condition at the bulk of installation orifice, which does not exist at the cylinder installation orifice; therefore, less freeze-ups.

Some question has been raised concerning the absorption of ethyl mercaptan odorant by dehydrating agents. This was true when Silica Gel was used as a dehydrating agent. Silica Gel absorbed minor portions of odorant. However, No. 101 dehydrating agent as approved by Underwriters Laboratory does not remove the odorant and actually retains a greater portion of moisture per unit.

Other Protection Needed

Regulators not only need protection from moisture, but also tank scale and chips, petroleum tars and other foreign materials. Because of the crystalline structure of dehydrating agents used in moisture removers, they provide the protective filtering service needed ahead of regulators and many operators now consider them as much a necessary part of the installation as the copper tube and relief valve. True, it is an additional installation cost, but one well paid for in service time and customer satisfaction. Dry gas at the regulator is the answer to the freeze-up problem. Moisture remover can perform this function better than any other media.

Regulator Operating at Maximum Capacity — 11" W. C. Outlet

Temperature Regulator Inlet	PROPANE	BUTANE
	Temperature Regulator Outlet	Temperature Regulator Outlet
120°F	60°	114°
100°	52°	88°
80°	41°	71°
60°	30°	55°
40°	18°	35°
20°	5°	-
10°	-2°	-

Servicing Control Equipment

By Carl E. Smith
Manager of Service Division
Minneapolis-Honeywell
Regulator Co.
Minneapolis, Minnesota

Warm Air Limit Control

These controls consist of a heat responsive element that measures the temperature of the warm air in the plenum and opens a switch if the temperature in the plenum exceeds the setting of the warm air limit control (Fig. 1).

The length of the sensing element will vary according to recommendations of the various furnace manufacturers. Some sensing elements are rigid, others are flexible, depending on the style adapted by the manufacturer for a given type of furnace.

A typical mounting is shown in Fig. 1a. It is important to follow the furnace manufacturer's recommendation concerning the mounting, location, and scale setting of the control. The bi-metal element must be located where it can respond quickly to temperature changes in the air. It must also be positioned to measure a representative portion of the plenum chamber. For example, it would

not be desirable to have the sensing element located near the edge or in a corner of the plenum of where it could be affected by the cold return air. Another location to avoid is that where the element is affected directly by radiated heat from the combustion chamber of the furnace. If the bi-metal is located too close to a hot surface, it will be affected more by the radiant heat than by the air temperature and would therefore tend to stop the burner at a lower temperature than it should. On occasion, this could result in underheating the home.

The outside case of the control should be installed where the scale setting can be easily adjusted. If it is a mercury switch type of control, it is essential that the unit be leveled for true verticle mounting to insure accurate tilting action of the mercury switches.

The warm air high limit control

THE high limit control on the gas burner used in home heating is an important safety device. It can be compared with a governor on an engine in that it prevents operation beyond a certain point of output. Its job is to prevent overheating of the furnace or boiler if for any reason the thermostat does not stop the burner. For example, if a short circuit should develop in the wiring to the thermostat, the burner would start and the thermostat would give no control over the burner. The high limit control would then function to stop the burner. It is wired in the circuit to have final control over the valve, regardless of the thermostat.

There are three general types of limit controls, each designed to function with a specific heating system—that is, warm air, hot water, and steam.

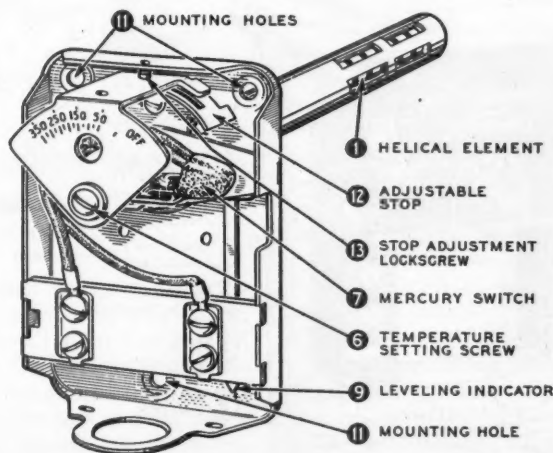


Fig. 1 — Honeywell LA419 Airstat—typical limit control for gravity warm air system.



exclusive

breaks its circuit at the indicator setting and remakes the circuit at this setting minus the differential. The recommended setting is the lowest one that will assure enough heat.

After the limit control has been installed, you should check it to be sure that the wiring is correct. For example, start the burner by setting the thermostat several degrees above room temperature. Then move the indicator setting on the warm air limit control to the low end of the scale and make sure that it then stops the burner. Reset it to the furnace manufacturer's recommended setting. Remember, also, to lower the thermostat to the original setting.

Usually there is no calibration problem involved on these simple controls, and there are no special instructions to give the home owner except to tell him to leave the cover on the control at all times and not to oil the mechanism.

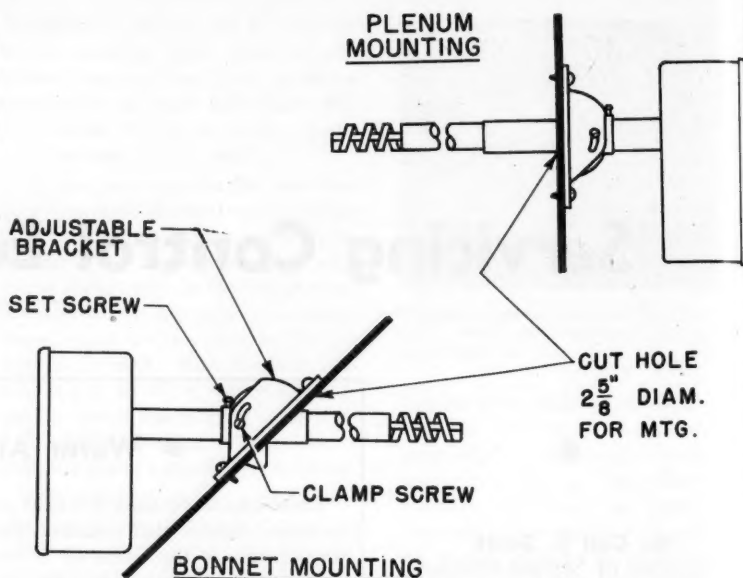


Fig. 1A — Adjustable swivel bracket, permits plenum or bonnet mounting of Airstat.

● Fan Controls

On forced warm air furnaces (see Figs. 2a and 2b), a control is used to permit the fan to start after the burner has operated sufficiently to raise the plenum temperature up to the required point so that warm air may be circulated. The contraction is the same as the warm air limit control except that the switching action is reversed. On the fan control, the circuit is closed on a rise in temperature. The simple fan control, such as the LA412, is used with add-

on blowers on gravity systems or if the furnace manufacturer desires to use separate limit and fan controls. The most common type of fan control is combined with the high limit control. Examples are LA401, the Honeywell combination furnace control with the rigid bi-metal element, and the L486 model which uses a liquid fill flexible sensing element.

It is important to follow the furnace manufacturer's recommendation as to location and temperature settings. It is generally desirable to

use the lowest fan settings possible without causing cool drafts from the registers before the fan stops.

Ordinarily the fan controls are applied by the furnace manufacturer and by following their recommendations good results will be obtained. However, the installation of the duct or the booting may change the air flow and require relocation or resetting on the job. If the element of the fan control receives too much radiant heat, it will cause the fan to blow cold air and may also cycle the

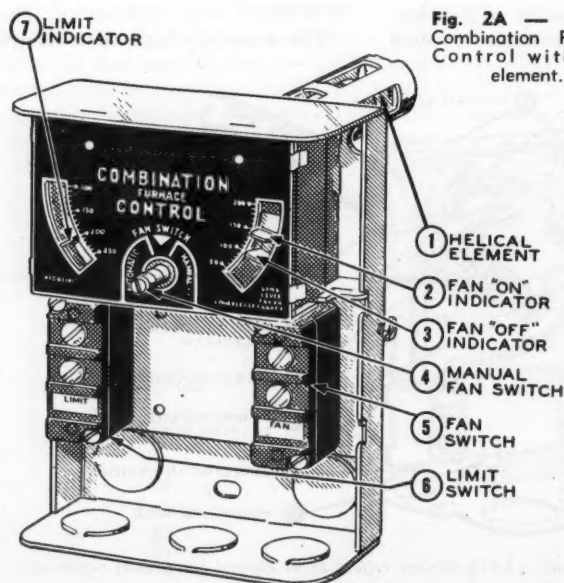


Fig. 2A — LA401 Combination Furnace Control with rigid element.

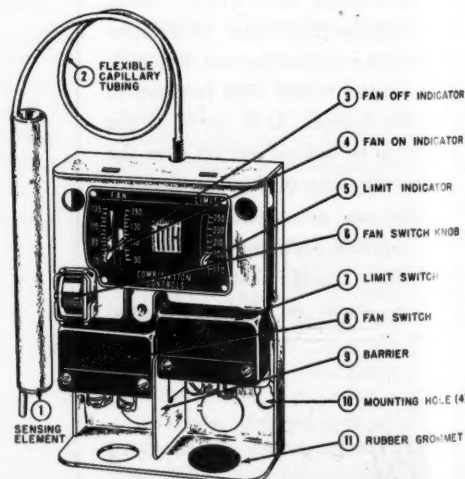


Fig. 2B — L486 unit of similar type—except for vapor-filled, flexible temperature sensing element.

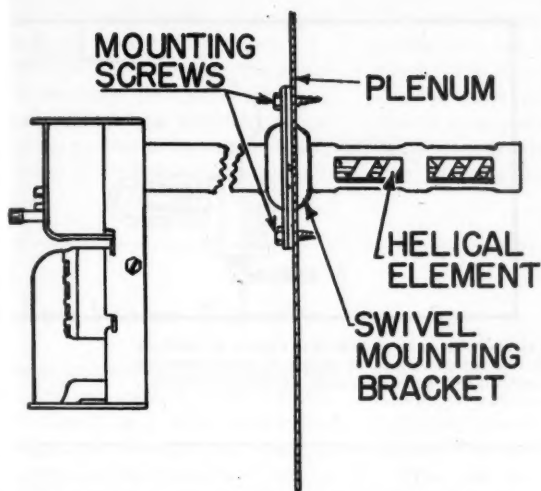


Fig. 3A — Plenum mounting of rigid element, LA401 Combination Furnace Control.

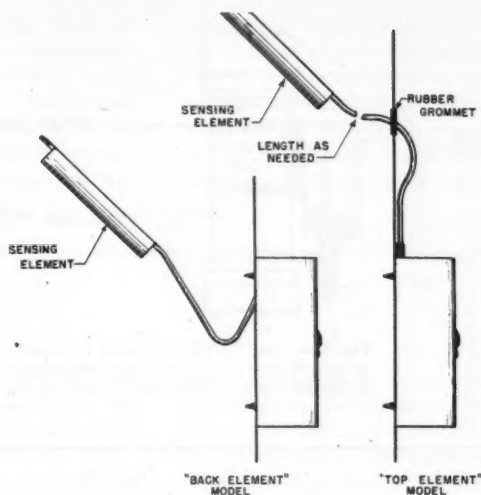


Fig. 3B — Methods of mounting similar device (L486) which uses flexible sensing element.

burner off of the high limit so that the room cannot be heated satisfactorily. The correction is to re-locate the control so that the element is less influenced by radiant heat. Sometimes this can be done very simply by pulling the control back or pushing it forward a few inches in its present location (Fig. 3a and 3b).

On the other hand, if the element receives too little radiant heat, it may cause the fan and high limit to lag too far behind the change in air temperature and sometimes overheat the furnace. This is often misinterpreted

as the control being out of calibration. The correction is the same as described above except that the object is now to increase the radiant heat effect.

Twisting or bending the case of a control when mounting it on uneven surfaces may throw the combination fan and limit control out of calibration. This can also happen if the case is severely strained when the conduit is connected to it. On flush mounting jobs, shims may be used where necessary if the surface is uneven. When hooking up conduit, the pipe or cable

should be cut to provide sufficient length and be sure that the pipe is properly bent to form an easy junction with the control case fitting without putting a strain on the fitting or case.

Where the surface temperature of the plenum or jacket will run 180° or higher, flush mounting may cause the control parts to warp from overheating and throw it out of calibration. A simple cure for this is to install an asbestos sheet or pad between the control case and the plenum.

● Hot Water Limit Control

These controls operate to stop the burner if the boiler water temperature exceeds the setting of the control. Like the warm air limit controls, they have a heat sensitive element which operates a switch to stop the burner when the water temperature reaches the setting of the control (Fig. 4). The heat sensitive element may be a bi-metal or a liquid fill. The switch may be of the mercury switch type or snap action. There are two general types of hot water limit controls—strap-on and immersion (Fig. 5a and 5b). The strap-on type is simply strapped to a riser about two feet above the boiler. This is used as a high limit device and is not intended as an operating control. To install it, scrape the surface of the riser clean and clamp the control securely to the riser, using the straps supplied with it.

Installing a surface limit control on a pipe smaller than 1½" may widen

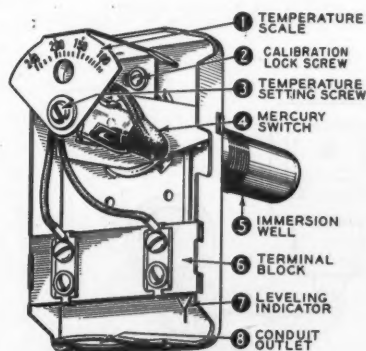


Fig. 4 — L444A Aquastat, hot water limit control.

the differential noticeably. It is important to try to get as large an area of contact between the riser and the back of the limit control as possible.

The immersion type limit control has an element that extends into a well that is screwed into the boiler. This provides a more accurate measurement of water temperature.

This well must be located in freely circulating water. It should not be located too near the cold return inlet, and it is important to avoid a pocket, baffles or excessive bushings. If the element is located where the water is trapped and not circulating freely, it will cause the Aquastat to lag behind changes in water temperature. This is especially a problem on jobs using flow valves and circulators. The installation of the well assembly should be such that the well will not strike or be forced against some portion of the boiler jacket. This would be likely to bend or dent the well and cause leakage through the well or interfere with the operation of the limit control.

The setting of the immersion type limit control should ordinarily be that recommended by the burner or boiler manufacturer, using the lowest setting that will assure enough heat.

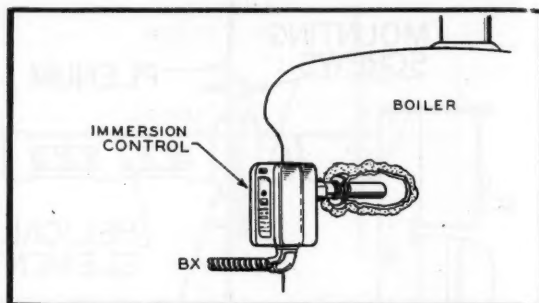
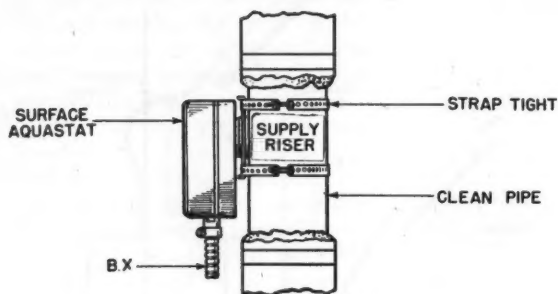


Fig. 5 — (a) LA409A Surface Aquastat. Metal strap holds sensing element closely to surface of supply riser. (b) Cut-away view shows L444A Immersion Aquastat which is more sensitive to temperature of boiler water. Sensing element, encased in a separable well, extends into boiler.

● High Limit Controls for Steam

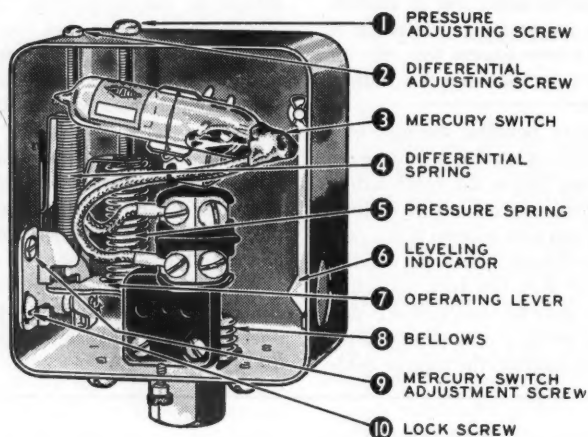


Fig. 6 — P404 Pressuretrol, high limit control for a steam system.

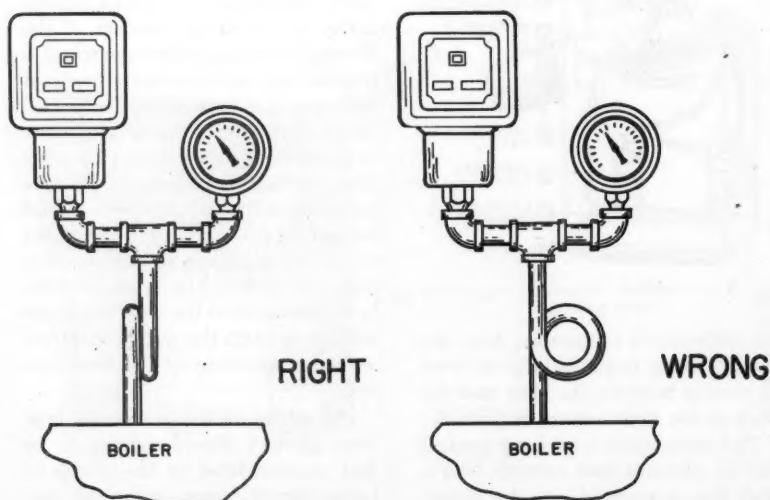


Fig. 7 — This shows right and wrong method of installing Pressuretrol, and use of siphon connection.

With a steam system, the function of the limit control is to stop the burner if the pressure in the boiler exceeds the setting of the control (Fig. 6). The most common type of pressure control consists of a metal bellows that will expand with a rise in pressure and operate to open the circuit in a switch.

The installation of a pressure control should conform to local ordinances. It should be mounted on a syphon to prevent steam or foreign matter from reaching the bellows.

On pressure controls using a mercury switch, the syphon coil must be at right angles to the front of the case as in the drawing above (Fig. 7). The purpose of the syphon is to permit condensate to form in it and thus help to protect the bellows from various types of gas that may be driven out of the water. The reason for having the syphon coil at right angles to the mercury switch is to prevent vibration that may come through the boiler to operate in the same plane as the mercury switch.

It is, of course, important to make sure that no sludge or lime obstructs the piping as this would prevent the change in pressure from being transmitted from the boiler to the pressure control. For the same reason, avoid excessive amounts of pipe dope on the threads. A shut-off valve should never be installed between the boiler and the pressure control.

This type of limit control is available in several scale ranges. You should, therefore, make certain that the pressure rating of the one you are installing is high enough for the operating pressures expected. The high limit pressure control opens its circuit at the main scale setting plus the

differential and remakes the circuit at the main scale setting.

When properly applied, the metal bellows used on this device give satisfactory service. However, there are some problems that arise due to corrosion of the bellows. You should,

therefore, make certain that the steam does not contain ammonia or other corrosive gases that would damage the bellows. Sometimes, where it is necessary to treat the water, over-treatment or under-treatment with the boiler compound may

result in an excess of oxygen or carbon dioxide which can corrode the bellows. On larger jobs, it is therefore important to see that correct water treatment is used. An oil seal barrier in the syphon will help prolong the life where this is a problem.

● Low-Water Cut-offs

These are used to guard against the hazard of low water in steam boilers. They consist of a float mechanism that operates a switch to stop the burner and, in some models, to start a water feeder if the water level drops. They are manufactured for various pressure ratings. You should, therefore, be sure that the one you are installing is rated to handle the expected pressures. It should be installed according to the directions of the

boiler manufacturer and wired into the circuit as recommended for the high limit control with the given type of gas valve used on the job.

After the low water cut-off has been installed, you should check its operation. Make sure that it opens the circuit at the low water level and with the boiler at operating pressure. This is an important safeguard on the boiler job.

The low water cut-off should be

blown down at least once a month or oftener if required. Instruct the home owner or building custodian how to do this. It removes any accumulation of sludge that may be in the float chamber which would prevent safe, dependable operation. About once a year, the low-water cut-off should be opened up so as to clean out the housing of any lime deposits that may have built up and which could not be removed by blowing it down.

● Summary of Common Service Call — As Applied to High Limit Controls

No Heat. About the only way that the high limit control could be the cause of a "no heat" complaint would be where it has operated to open the circuit and then, for some reason, failed to remake the circuit when the temperature or pressure had dropped sufficiently. This could be due to trouble in the switch or in the sensing

mechanism that operates the switch. If the trouble is in the switch, this part can be replaced on the job. If it is in the sensing mechanism, it would be advisable to replace the limit control with a factory rebuilt one. "No heat" could also be due to a faulty contact, lead wire, terminal, or broken circuit to or from the limit control.

Won't Shut Burner Off. This could mean that the control is damaged and should be replaced or has been installed incorrectly. Possibly it is located where it cannot respond to temperature changes or, in the case of a pressure control, the piping to the pressure control or the pipe connection is plugged with rust or sludge.

● Safety Pilots

The purpose of the safety pilot on the gas burner is to insure the presence of the pilot flame for safe, reliable ignition of the main burner when the control valve opens. If the pilot light has gone out or is insufficient for safe ignition of the main burner, the safety pilot prevents opening of the control valve.

Most of the pilots now being used consist of a thermocouple that generates a small voltage from the tip of the couple that is enveloped by the pilot flame (Fig. 8). The current that is generated is used to energize an electrical coil which holds the valve of the safety pilot open (Fig. 9).

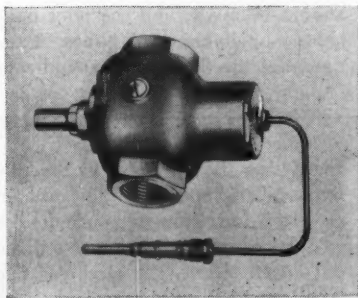


Fig. 8 — Honeywell C541 Pilotstat provides 100% shut-down in event of weak pilot flame, or failure of pilot flame.

Since the liquefied petroleum gases are heavier than air, the safety pilot

used must provide 100% shut-off on both the pilot burner and the main burner if the pilot flame goes out. Otherwise, any unburned gases would accumulate in the combustion chamber and basement, setting up a potentially hazardous condition. In connecting the valve or safety pilot in the gas line, it is essential that you use pipe dope that is suitable for LPG. The pipe dope must be insoluble in petroleum products. You should also check local ordinances for other safety requirements on LPG installations.

Before installing the automatic safety pilot (Fig. 9), check the

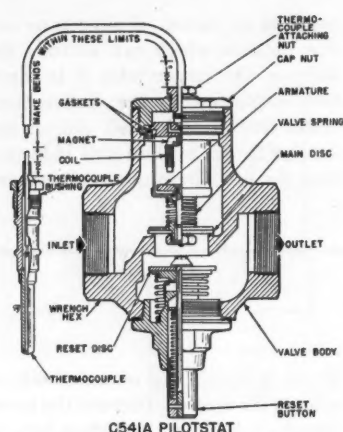


Fig. 9 — Cross-section view of the C541 Pilotstat.

stamping on the pilot burner for correct sizing of orifice to be sure that it is correct for the gas used. The normal drill sizes for LPG are considerably smaller than those for natural, mixed or manufactured gases. For L. P. gases they range from about .011 to .013.

You should be careful to avoid kinks or sharp bends in the thermocouple lead.

The pilot burner would ordinarily be located by the burner manufacturer where the pilot flame will remain stable. Avoid spots where strong secondary air draft would pull the pilot flame away from the thermocouple tip and allow it to cool and close off the pilot valve. In operation, the pilot burner must be able to get sufficient secondary air even during main burner operation so that the pilot burner flame characteristics do not change. The pilot burner flame should not be affected by puffs when the main burner ignites or shuts down.

The flame impingement of the pilot flame on the tip of the thermocouple should not reach any further than one-half inch down from the tip.

● Service

Important. Only a qualified service man should attempt to service the pilotstat. If it is not functioning properly, proceed in the following manner:

1. Check the pilot burner. The flame on the thermocouple should be a steady blue. A yellow flame indicates lack of air often caused by dirt

Shields, baffles, or secondary air draft diverters may be used to correct any of the conditions described above (Fig. 10).

After the job has been installed, the following observation and test should be made.

1. The pilot burner must not smother or snuff out on:

- a. Burner ignition from a cold start. Repeat this several times.

- b. Main burner ignition with appliance at maximum operating temperature. Repeat this test several times.

that the pilot flame is being smothered by the products of combustion from the main burner. A new location of the pilot burner or proper baffling is necessary so the pilot burner will be provided with sufficient air. In observing the operation of the pilot burner, it is important that all appliance doors be in the final operating position. The use of a long handled inspection mirror is helpful in obtaining a clear view of the pilot flame under true operating conditions.

3. In the application of the pilot

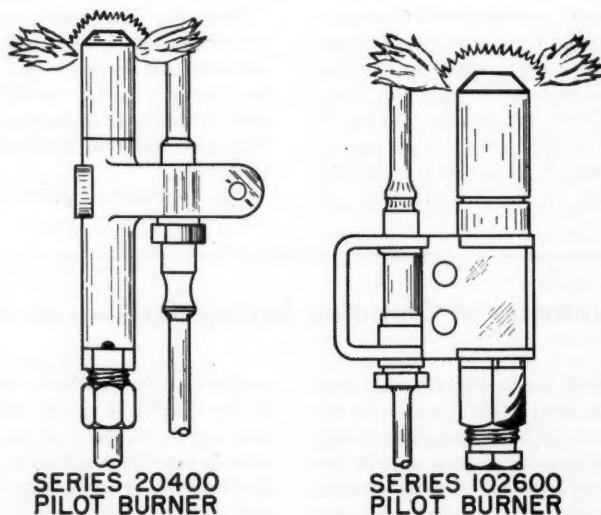


Fig. 10 — Typical assemblies of thermocouple and pilot.

- c. Normal variation in air adjustment of main burner.

- d. Continued operation of main burner.

2. Observations of the pilot flame under the various test conditions should be made, and the pilot flame should be stable at all times. A tendency of the flame to float indicates

burner, AGA requirements for the particular appliance should be consulted. The AGA turn-down test for pilot burners states "the pilot of the device shall effect immediate ignition of the gas at the main burner when the gas supply to the pilot is reduced to a point where the flame is just sufficient to keep the valve open."

restricting the air holes in the pilot burner. This, and even pilot outages, are often due to plugged air holes due to dust, especially in homes still under construction. The air holes may be cleaned out with pipe cleaner or a small brush. The pilot orifice should also be cleaned with a small piece of wire.

2. Be sure that the pilot flame envelops the thermocouple for at least

$\frac{3}{8}$ of an inch and not more than $\frac{1}{2}$ inch.

3. Check for bad draft conditions that may pull the pilot flame away from the thermocouple. If the drafts cannot be eliminated, it will be necessary to shield or baffle the pilot flame. This is particularly likely to be a problem if the chimney is of insufficient height. If the chimney is lower

(Continued on page 116)

Let's Make Safety Everybody's Business

What Makes L.P. gas Tanks SAFE?

SAFETY MEETING

Date _____
Time _____
Place _____





Let's make SAFETY Everybody's Business

No. 13

Suggested Program for Safety Meeting

- 1 — Complete the attendance record, noting the absentees.
- 2 — Is there any unfinished business relating to previous meetings, or suggestions for safety improvement projects which have not yet been carried to completion?
- 3 — New business — This is the place for fire extinguishment demonstrations. Witnessing these will give the men better understanding of the material to be discussed.
- 4 — Discussion of "Fire Fighting and Extinguishment," which was published in the January installment of the Safety Series.
- 5 — This would be an appropriate time to see that all fire fighting equipment in the plant and on the vehicles is inspected and found to be in top working condition. If you do not have a systematic check-up for the fire extinguishers scheduled, this would be a good time to make such arrangements.
- 6 — Announce date, study assignments, and any special assignments for the next safety meeting. If the men do not already have them, they should be provided with copies of Pamphlet 58 and the state and local codes applying to storage of L. P. gas. Pamphlet 58 may be obtained from Liquefied Petroleum Gas Assn., 11 S. La Salle St., Chicago, at 20 cents per copy, or from National Fire Protection Assn., 60 Batterymarch St., Boston, at the same price.

DISCUSSION GUIDE FOR Fire Fighting and Extinguishment

We now approach the very practical problem of handling emergencies which may arise in the plant, during delivery operations, and wherever and whenever the control of a fire may be necessary. There is no substitute for planning and training. Every man on the staff may at sometime find it necessary to put out a fire under circumstances which could result in a major loss unless he does the right thing at once.

After a fire starts is no time to wonder what to do. The man should know before the fire breaks out. He should be so thoroughly trained that he will automatically do the right thing. This requires thought, understanding, and *practice*.

We suggest that you review all precautions and

plans made to date for the prevention and control of fires in connection with your operation, asking each man to make a detailed analysis of the fire hazards connected with his part of the operation and the possible circumstances under which fires might occur, and then develop and practice the methods and procedures necessary for the control and extinguishment of these possible fires.

If the men understand the reasons for the procedures developed in these theoretical cases, they will be prepared to handle emergencies of an unforeseeable nature. This is the reason for, and the goal of all organized training in fire departments. The competent L. P. gas employee is a competent fireman within the area of his daily work.

Poster on opposite side should be placed on bulletin board after meeting

What Makes Storage Tanks Safe?

By Carl Abell



Welding a 30,000 gal. tank 70 ft. long and 10 ft. in diameter at American Pipe and Steel Corp.'s Plant No. 1, Alhambra, Calif.

THE principal features that make liquefied petroleum gas storage tanks safe are far older than the L. P. gas industry. Some of them date back to the early days of the steam engine, which was first put to work by James Watt in 1781. The science of pressure vessel design has developed around the experience with steam boilers during the past 170 years. This basic knowledge has been adapted by leaders of the engineering profession in the development of principles for the design, manufacture and testing of unfired pressure vessels. The accumulated knowledge of this subject has been compiled by the American Society of Mechanical Engineers into a handbook known as the Unfired Pressure Vessel Code. This volume contains the basic information used by fabricators of tanks for the storage and transportation of all liquids and gases which develop vapor pressure within their containers without the direct

application of heat. The initials ASME are used to designate pressure vessels made in direct compliance with the Unfired Pressure Vessel Code.

On certain tanks the code marking will appear as "API—ASME." This is a special code that has been worked out jointly by the American Petroleum Institute and the American Society of Mechanical Engineers. It is based on the ASME code, and the final results are substantially the same. We may look upon this code merely as an engineering convenience—a more direct application of the principles of the ASME code to the specific problems of the petroleum industry.

Under either of these codes, the objective is to provide safety in the storage, handling, and transportation of products that exert pressure other than that of gravity upon their containers at normal atmospheric temperatures.

There is a third code with which

we are all familiar, known as "ICC," which indicates that the container is made in conformity with the regulations issued by the Interstate Commerce Commission of the United States government. This code is based on the same engineering principles underlying the ASME code, but with special variations to meet the problems encountered in shipping liquids and gases under pressure on the "public carriers" over which the Interstate Commerce Commission has jurisdiction. The fact that these same containers are used for customer storage is incidental. The basic problems to be met with these containers are those which occur in transportation, in which the strain on the structure and equipment is more severe than in stationary use. These ICC containers are accepted under all state codes.

A pressure vessel that is suitable for one purpose may be unsuitable for containing some other commodity. Commonly known vessels include compressed air tanks, water pressure systems, and cylinders for oxygen, carbon dioxide, acetylene, and various other industrial and medicinal gases, besides the containers used for propane and butane. Their construction is not always the same for these different commodities, because the nature of the products and the conditions surrounding their use differ widely. The three codes mentioned above cover a wide variety of conditions, and somebody must select the provisions suitable for each commodity.

In our industry, most of the job of selection for ASME type containers is performed in the specifications which originate as recommendations of the Technical and Standards Committee of the Liquefied Petroleum Gas Assn. These recommendations are considered by the committee on gases of the National Fire Protection

Material for Employees to Study for Safety Meeting No. 14

Assn., along with any other pertinent data that may be available. The final results are published by this association as "NFPA Pamphlet 58, Standards for the Storage and Handling of Liquefied Petroleum Gas." This pamphlet is accepted as the safety standard of the industry. It is revised periodically, as experience indicates the need for changes. The National Board of Fire Underwriters adopts the provisions of each new edition of NFPA 58, and republishes it as NBFU Pamphlet 58, making it the standard working code for the use of the inspectors and adjusters of the various fire insurance companies.

Nearly all of the states have adopted Pamphlet 58, or have passed laws patterned closely after the provisions which it contains, in establishing codes for public protection in the handling and storage of L. P. gas. Some of the states have gone so far as to adopt, by reference, "the current edition of Pamphlet 58," which automatically makes the state code conform to the changes and improvements of the pamphlet without further legislative enactment. In a few of the states, special provisions have been enacted which are for the most part in addition to the provisions of Pamphlet 58. These have principally to do with the tank markings and with testing and inspection, which will be covered in subsequent paragraphs.

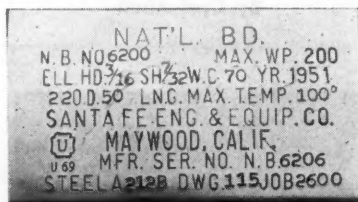
Codes Make For Safety

The purpose of all of these codes and procedures is to eliminate structural conditions in the containers which might result in accidents, and thereby make it safe for people to work with and use products, including liquefied petroleum gas, which must be stored under pressure. There are licensed inspectors in every state whose duty is the enforcement of the state codes, which indirectly secures compliance to the engineering codes under which the tanks are manufactured.

For simplification of all future inspection procedures, each tank is permanently marked with the data that might be needed by any inspector to determine the suitability of the tank to hold the product in question. In the L. P. gas industry, all containers other than ICC types must be marked with the following information:

1. A marking identifying compli-

ance with the code, and other markings required by the rules of the code under which the container is constructed; or the stamp and other markings required by the National Board of Boiler and Pressure Vessel Inspectors. The plate illustrated



herewith, a standard ASME tag for a motor vehicle fuel tank, includes both the National Board serial number (upper left) and the ASME symbol (near lower right) together with the paragraph of the code (U 69) under which the tank was manufactured.

2. Notation as to whether the system is designed for underground or aboveground installation. (This is not included on motor vehicle fuel tanks, as they will only be used aboveground.)

3. Name and address of the manufacturer of the system, or the trade name of the system.

4. Water capacity of the container in pounds or gallons, U. S. Standard (on this tag, W. C. 70).

5. The working pressure in pounds per square inch for which the container is designed. (Max. W. P. 200.)

6. The wording "This container shall not contain a product having a working pressure in excess of — psi gauge at 100° F." (This is ordinarily on a separate tag attached to the filler connection, so it cannot be overlooked by the person filling the tank.)

7. The tare weight in pounds or other identified unit of weight for containers with a water capacity of 300 lbs or less. (This is not required on underground tanks or motor vehicle tanks—only on those that may be filled by weight.)

8. Markings indicating the maximum level to which the container may be filled with liquid at temperatures between 20° F and 130° F except on containers provided with fixed maximum level indicators, or which are filled by weighing. Markings shall be in increments of not more than 20° F. (These markings are generally shown on the liquid level gauging device.)

9. The overall length and outside diameter of the container in inches (Required on underground tanks only. These dimensions, and the thickness of steel in the heads and shell, are frequently included as a convenience for inspectors on tags for any aboveground installation.)

Most manufacturers also include on the permanent tag certain other data which permit positive identification of the tank and the material from which it was made, at any future date. The information on the two bottom lines of the tag illustrated serve this purpose. This information, and all other items listed above, are required under the ASME rules. Only the numbered items are included in the rules given in NFPA Pamphlet 58.

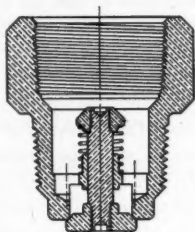
The manufacturer must use an approved method of welding, and is responsible for the quality of the welding done by his organization. Each finished tank must undergo severe tests, and be accepted by an inspector licensed by the authorities under which the tank is manufactured.

The tests vary according to the code under which the tank is made. As an example of the testing involved, this is the procedure under paragraph 69 of the ASME 1949 code: The tank is filled with water and all openings are tightly plugged. The hydrostatic pressure is raised until it is at least one and one-half times the designed working pressure of the tank. In a 200-lb WP propane tank, the minimum pressure is 300 lb. While at this pressure, all welded joints are subjected to a hammer or impact test, after which the hydrostatic pressure is further increased until it is at least double the allowable working pressure of the tank. While at this pressure a thorough inspection is made for leaks. After acceptance, the tank is drained and dried. There are permissible variations to this test procedure, but their requirements are no less rigid.

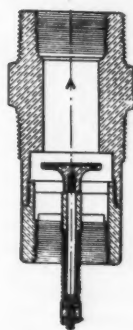
Factor of Safety of 5

Tanks constructed in accordance with the ASME U-69 code have a factor of safety of 5. This means that they can withstand 5 times the designed working pressure without rupturing. Under the API-ASME code, the factor of safety is 4. Figuring backward from the same ultimate strength used in the above example

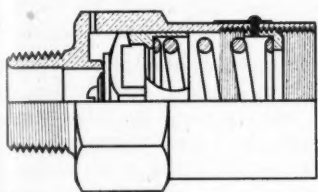
Fundamental Valves and Fittings Which Make Tanks Safe



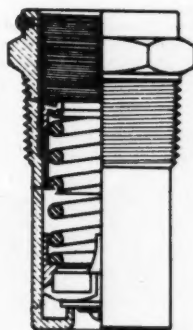
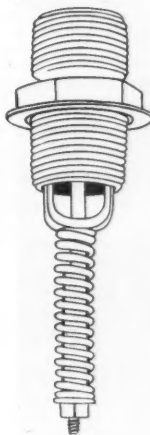
● Back flow check valve, which always remains closed except when fuel flow from outside forces it open.



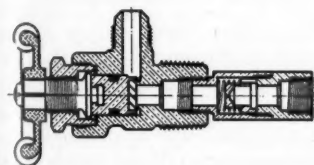
● Excess flow check valve, which permits flow in either direction, but closes automatically when outward flow exceeds safe rate.



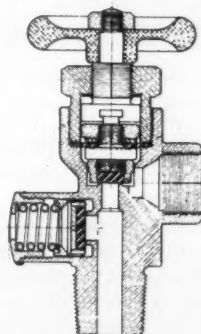
● Pressure relief valve, external type, held closed by coil spring unless tank pressure becomes higher than "working pressure."



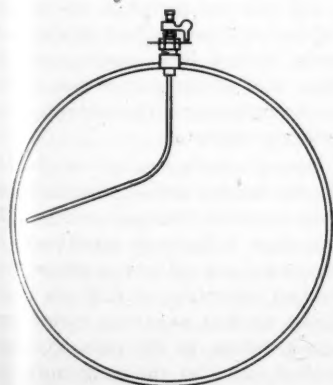
● Pressure relief valves, internal types. Accidental damage to portion outside tank does not affect closure.



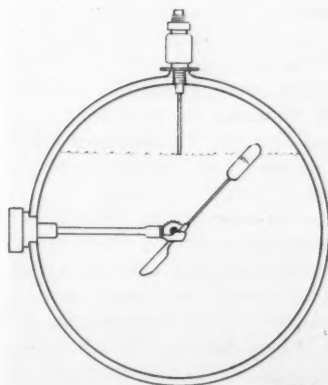
● Liquid service valve with integral excess flow check valve, for customer bulk tanks and motor vehicle fuel tanks.



● POL valve with built-in pressure relief, for vapor withdrawal from cylinders. Also comes with excess flow check valve and with extension tube for liquid withdrawal.



● Rotary liquid level gauge, indicates fuel level by emergence of liquid or vapor as unit is turned by hand with bleed valve open.

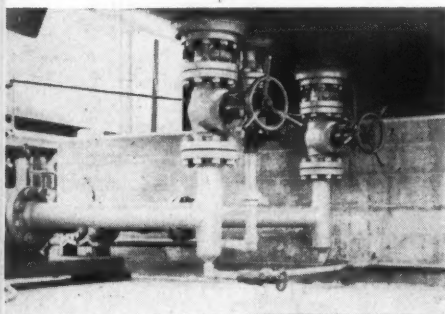


● Magnetic liquid level gauge gives direct reading by rotation of magnet geared to float affecting external magnetic needle. Fixed liquid level gauge discharges liquid through bleed when liquid level reaches end of tube.



Levers and cables open valves shown below. May be released for closing from another station 100 ft. distant.

Self-closing positive shut-off valves (Bohnhardt) close these outlets when not in use.



(1000 psi) the API-ASME working pressure rating for this same tank is given as 250 psi.

ICC tanks (cylinders or bottles) must not only withstand the same internal pressure as the permanently mounted tanks, but in addition they are subject to external shocks and stresses while in transit. This requires stronger construction, which may be obtained by using heavier material of corresponding strength, or higher strength material of sufficient thickness to provide the required strength. The standard 100-lb ICC cylinder has a working pressure of 240 psi.

The markings on the ICC cylinder are simpler than on the "code" tanks, generally including only the manufacturer's name or brand name, a serial number, the tare weight, the date of manufacture, the ICC specification data (ICC 4BA 240) indicat-

ing suitability for propane service, and the filling density. The tare weight is necessary as a guide in filling, so the correct amount of fuel and no more may be weighed in. The date of manufacture is necessary so retesting, as required by the ICC regulations, may be done before the specified maximum period has elapsed.

WHEN tanks are installed for service, it is necessary to get fuel into them, and then get it out. This requires openings and valves, the size, location, and types of which vary with the service in which the tank is placed. Valves must be made of material which will render satisfactory service in L. P. gas, and those that are subjected to container pressure are required to have a working pressure of at least 250 psig. This, as you will note, matches the strength of the tanks—we want no weak links. The closure unit of the valve is subject to wear, which means that at some time we must expect to remove or disassemble the valve for maintenance work. With several hundred or several thousand gallons of fuel in the tank, we do not want to transfer or remove the fuel, and we do not want to risk allowing it to escape in to the atmosphere. What then?

The regulations tell us that every major valve used in filling or drawing fuel from the tank shall be mounted in conjunction with another valve, located either inside or at the opening of the tank, which can either be closed mechanically, or will close automatically to prevent any major fuel loss. These internal valves also serve a second safety purpose—in case of breakage of a pipeline or hose beyond the manual shutoff valve, the escape of fuel may be brought under control, almost instantly in the case of the automatic valves, or quickly in case of mechanically or hydraulically controlled protective valves.

Types of Acceptable Valves

The types of valves acceptable for automatic closures in these locations are (1) back-flow check valves, and (2) excess-flow check valves.

The back-flow check valve is a one-way automatic closure, which is held against its seat by a light spring. It is used primarily in the filler connec-

tions of tanks, where the flow of fuel is inward, but not outward.

The excess-flow check valve permits normal flow of fuel in either direction, but when the outward flow exceeds the volume for which the valve is designed, it closes, remaining closed as long as lower pressure exists outside the valve. The closure disc of this valve is perforated with a small drilled hole, which allows a slow bleeding action to take place. This has no effect on the position of the excess-flow valve disc as long as the external line remains open. When the external shutoff valve is closed, the fuel bleeding through the hole allows fuel to pass slowly until the pressure outside the excess flow valve equals the tank pressure, when the excess-flow valve disc is released, and returns to the open position.

(In case this head bleed hole ever becomes plugged, equalization will not take place, and the valve remains closed. It is then necessary to disassemble the piping as far as the excess-flow valve body, after which the obstruction may be removed with a drill of the correct size, or in some cases with a fine wire. The valve will not reopen until the piping is reassembled and the valve in the pipe line is closed.)

Check Valves Required

Excess-flow check valves are required on all openings through which major quantities of fuel may be withdrawn, except the pressure relief valves (which will be discussed in a later paragraph). Filler valves which are equipped for withdrawal of fuel through a special adaptor, as for filling tractor tanks, are equipped with one back-flow check valve (which is opened by physical contact with the withdrawal adaptor) and one excess-flow check valve.

All external piping in the system beyond any excess flow check valve must have a flow capacity greater than that of the excess-flow valve, or the latter cannot provide the necessary protection.

Special provisions are made for double valving of the outlets for domestic tanks of 1200 gal. or less, ICC cylinders, and certain small tanks in liquid withdrawal service where only limited quantities of fuel are used. These do not require excess-flow check valves, as the manually controlled valve at the tank outlet is

followed immediately by a pressure-reducing valve, which limits the escape of fuel. These special provisions are contained in paragraph 2.2 (d) of Pamphlet 58, with which all L. P. gas drivers and servicemen should be completely familiar.

Other Protective Valves

Two other types of protective valves are permissible in place of excess-flow check valves at the liquid outlets of LPG tanks, and are frequently used in large storage tanks and in bulk truck tanks to give the operator complete control. These are a mechanically controlled quick-acting valve which is installed directly on the outside of the tank outlet, and a hydraulically operated quick-acting internal valve. Either of these valves may be remotely controlled from any desired distance, and they are generally installed so they close themselves when the control mechanism is released. The hydraulically operated valve may also be installed with fusible plugs in the control line, so any fire breaking out in the immediate vicinity of the line will release the hydraulic pressure, automatically closing the valve if it happens to be open at the time. This control line may be extended to any portion of the storage plant, locating fuse plugs in any area where fire might possibly occur.

Temperature conditions which might cause the pressure in a tank containing L. P. gas to exceed the working pressure of the tank might conceivably cause the pressure to go much higher in a very short time. To prevent rupturing of the tank, which would immediately discharge its contents and create a tremendous hazard, we install pressure relief valves. These valves are designed to open automatically when the internal pressure of the tank exceeds that specified for the design working pressure of the tank under the code used in its construction. The pressure relief valve (or valves) is installed in communication with the vapor space at the top of the tank, so if rising temperature should ever cause it to discharge, only vapor will be released.

The NFPA provides a reference table in Pamphlet 58 (Appendix A) from which we may select safety relief valve sizes to provide the proper protection for the tanks of various sizes. This table is calculated on a

great deal of engineering data, including the cooling effect of the evaporation of fuel to replace that which has been discharged. Under no circumstances should replacements be made with valves having a lower discharge capacity than those specified in the table.

It should be noted in paragraph 2.3 (c) of Pamphlet 58 that underground storage tanks may be equipped with pressure relief valves having only 30% the discharge capacity of those required for the same size tank mounted aboveground. From this we reason that tanks that are safe underground may not be safe aboveground, and certainly no chances should be taken with them until it has been determined that they have the proper working pressure for the product to be stored, and until the safety relief valve equipment conforms to Appendix A.

Valves Set At Factory

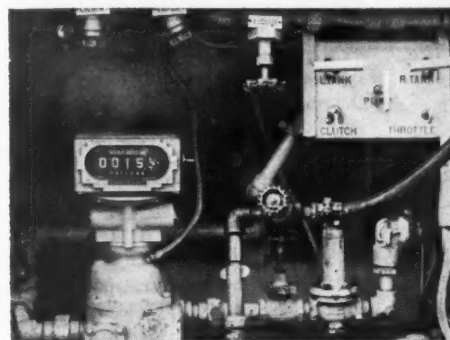
These valves are set at the factories for a certain opening pressure, which is marked on the body of the valve. They should never be tampered with in any way, as it is not possible to reset them accurately in the field, and any change that would make them open at a higher than standard pressure, or interfere with their functioning in any way will defeat the purpose for which they are installed.

These valves provide protection against overpressuring, and hence they cannot be used in conjunction with any form of check valve. If a pressure relief valve gets knocked off, it is just too bad—the entire contents of the tank will escape. Not so long ago they were all made to mount externally on the tank. The need for a safer design for truck and tractor mobile tanks resulted in the development of such a valve, built with the working parts completely within the tank. This is much safer for exposed locations, and is now almost universally used on new mobile tanks, and to some extent in domestic tanks.

If we make provisions for the discharge of combustible gas under conditions where excessive heat is present, we need also to make provisions so there will be the least possible chance that it will become ignited, and the best possible protection from damage to surrounding structures. It is therefore against the rules to

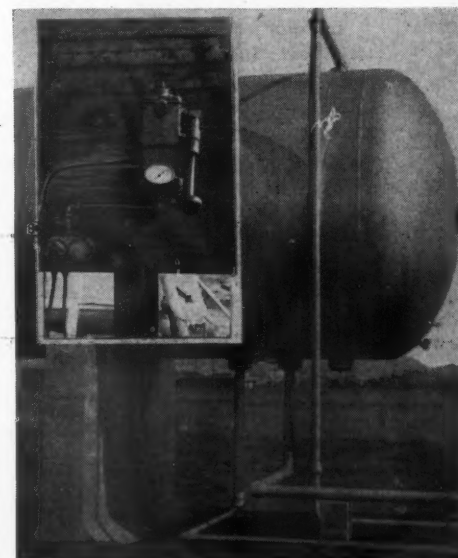
allow the discharge to terminate in or under a building, or to locate a container within 5 ft horizontally from any opening into or under a building at a lower level than the safety relief valve. Now let's do a little more thinking on that same subject. Which way should the safety relief valve of a cylinder be pointed in relation to the wall of the house (or trailer), and in relation to the adjacent openings in a building?

Tanks of 2000-gal. capacity or over are required to have the discharge of the pressure relief valves piped vertically up for a height of 7 ft above either the tank or the surface of the ground, depending on whether the tank is aboveground or under-



Above: Control handles (arrows) for Bohnhardt valves in outlets of these bulk truck tanks must be in closed position before cabinet door can be shut.

Below: Hydraulic remote control (inset) operates Shand and Jurs self-closing valves in all of these tank connections. System is also used in truck-mounted tanks.





Rotary gauge must be operated by hand to determine liquid level.

ground. This pipe serves two purposes—it discharges the gas high enough in the air that it should be dispersed below the flammable limit by the time it reaches the ground, and in case ignition should take place at the outlet, only moderate heat would reach the tank from the fuel burning at its tip. This pipe should have a loose fitting rain cap to prevent the accumulation of rainwater in the body of the valve. In all but the driest climates there is the further possibility that moisture condensing within the pipe might also accumulate in the valve, causing corrosion and weakening of the spring and consequent lowering of the operating pressure to the valve. To prevent this, a “weep hole” is provided in the body of the valve. It is of utmost importance that this hole should be so placed and protected that if gas discharging through this weep hole should become ignited, the flame will not impinge on the shell of the tank.

In some of the earlier tanks you will find “fusible plugs” instead of pressure relief valves. The fusible plug was drilled through the center,

Magnetic gauge is designed to give direct instantaneous reading.



and filled with a metal of low melting point, which was supposed to melt out when exposed to fire and release the contents of the tank to prevent rupture. These devices had several disadvantages, the greatest of which was their inability to close after discharging enough of the tank contents to bring the temperature down by evaporation to within safe limits. When a fusible plug melted out, the entire tank contents were lost, sometimes creating a very considerable hazard. Because of this limitation, they have been superseded by the spring-loaded pressure relief valve.

Fusible Plugs May Be Illegal

In several states these fusible plugs are now illegal as components of tanks, although the tanks, if re-equipped pressure relief valves complying with the code, are legal for products having suitable vapor pressures. The customary location of fusible plugs in ICC cylinders was on the bottom, inside the standing ring, where they were protected from physical injury. Because of the superior safety characteristics, pressure relief valves should be substituted for all fusible plugs in either permanently mounted tanks or portable cylinders.

IN the operation of a storage tank, we need to know how much liquid gas it contains, and more important, how much more it can hold within the safe limit. We need to know with certainty when that safe limit is reached. This would not be a complicated problem if all L. P. gas were identical. But it comes in varying mixtures, from almost pure propane to almost pure butane. These have different rates of expansion due to increased temperature. A gallon is not always a gallon—when the temperature goes up it becomes more than a gallon. Unfortunately, a tank does not increase its capacity due to thermal expansion as fast as L. P. gas increases its bulk with the same temperature increase. Since liquid is incompressible, it would be possible, in an overfilled tank, for the liquid to reach the pressure relief valve, discharging as liquid, and turning into gas at from 240 to 270 times its liquid volume, depending on the percentages of butane and propane in the stored fuel. This discharge of liquid is one thing we are most anxious to

avoid. It is therefore necessary to maintain sufficient vapor space above the liquid in the tank to permit maximum expansion of liquid without reaching the pressure relief valve.

In paragraph B.11 (a) of Pamphlet 58 we find a table of “Maximum Permitted Filling Densities.” “Filling density” is defined as the percent ratio of the weight of the gas in a container to the weight of water the container will hold at 60° F. The average operator does not have the necessary equipment to measure the specific gravity of the fuel in his incoming shipment, and calculating the permissible delivery into every tank into which the fuel may be distributed would be quite a chore. In putting fuel into a large storage tank, the engineering calculation based on the table of filling densities is justified. For practical distribution, there must be an easier way.

A Practicable Table

Appendix E of Pamphlet 58 gives us the practical method of determining how much fuel may be put in a container holding up to 1200-gal. total water capacity. This table is based on either underground or above-ground storage, and since it may be anticipated that at some time or other all containers suitable for propane storage may contain propane, the fixed means of determining fluid height in the tank, if one is used, should indicate the appropriate level for propane. Appendix F gives the formula and instructions for determining the length of the “fixed dip tube” which is installed in many tanks to indicate when the maximum permissible liquid level is reached. This unit is a desirable double-check on the calibrated magnetic or rotary gauge, which are also supposed to give the information on permissible filling depth. The fixed tube gauge can only indicate one condition—that the fuel level either has or has not reached its tip. It should correspond with the reading of the rotary or magnetic gauge at the moment that the liquid level reaches the dip tube—failure to coincide indicates that one or the other of these units is faulty.

There are two types of tank gauges in common use—rotary and magnetic. They are made for tanks of standard diameters, and for definite mounting positions, as on the center

line, 45° position above center, and top mount. If it is ever necessary to install a new gauge in any tank, it is of the utmost importance that the correct gauge be used. Both types have calibrated dials, which are a bit unhandy to use because one factor in the calibration is temperature and the other is fuel mixture, one or both of which may not be known, and which also may fall between the scales on the gauge. The simplest safe way is to stop filling when the liquid begins to show at the fixed dip tube gauge, or at the corresponding reading on the rotary gauge dial. Magnetic gauges, although quick and easy to read, need to be supplemented with a fixed dip tube indicator so we can be certain that the reading at the moment is correct. These gauges are accurate if the mechanism is not binding, but we can never be positive that the needle reading is correct without having something else to give a "check point."

Other types of gauges not so frequently encountered in storage tanks are the glass tube sight gauge and the slip-tube gauge. Glass tube gauges are still found in a few of the older bulk plants. They are accurate and quick reading, but are subject to

breakage. If this type gauge is used, both tank openings to which it is connected should be equipped with excess-flow check valves.

The slip-tube gauge is used principally in tank cars, although it is also used in vertical tanks such as those on the Oliver tractors. It is extremely accurate, but requires more than average maintenance work, and careless use can result in bending of the tube, which necessitates replacement.

Pamphlet 58 also specifies that all storage tanks of 1200-gal. capacity or more shall be fitted with a suitable pressure gauge. This must be connected directly into the tank, and may be pressured either with liquid or vapor. It should be located where it can be seen from the ground, when the attendant is in a location customarily used while in the regular course of his duties. The gauge is a check on conditions in the tank. It will seldom register anything requiring attention, but it would be easy to miss its warning unless it could be seen without effort or special attention.

Thermometers are necessary in tanks only in case such large transfers are made out of the tank that temperature correction would make

an appreciable difference in the delivered quantity. An arrangement similar to the thermometer well in a tank car is ideal if a thermometer is to be used. Anti-freeze compound is used as the fluid in this well.

The design requirements for tanks used in the L. P. gas industry give them high factors of safety throughout, for the product and in the location that were contemplated in the original manufacture. That still does not guarantee that no mistakes will be made by people who use the tanks. Propane may be put in a butane tank equipped with a safety relief valve that will send out a geyser of gas as soon as the sun gets a good shot at the tank. Tanks in particularly hot locations may need shade, sprinkling, or a change to a product of lower vapor pressure, even though they were properly designed and equipped for propane. Men have been known to fill tanks beyond the safe limit, with regrettable consequences. This could go on and on, but let's summarize it—tanks made according to the rules are safe. Men who ignore the rules, or try to make their own rules, are not safe. And men who do not know the rules are positively dangerous.

Answers To Problems on Page 60 of January Issue

Problem 1. You do not open the cabinet door until you get the truck out in the open, completely away from buildings and fuel storage. If you can do so without passing close to a source of ignition, you may use your fire extinguisher at once to put the fire out, directing its contents through a small opening in the cabinet without opening the doors to admit extra air. After getting the truck away from all hazards, you may open the door to locate the source of the fire. If a minor gas leak is found in the piping or equipment, it can be stopped by closing the valve—mechanical or automatic—back of the point of escape. If this is an excess flow valve, it can be closed by quickly opening the manual valve to the delivery hose. You should know the equipment in your truck, and have all these possibilities figured out in advance. Know what to do before the emergency arises, so you will not need to stop to figure the answers after the trouble arises.

Problem 2. Here's where a demonstration by an experienced fire fighter would come in handy. You would naturally approach the fire with the wind at your back. You can then direct the stream from the extinguisher at the base of the fire nearest you, and the wind and the convection current at the fire would carry the gas formed by the extinguisher charge into the fire, smothering it. Follow the dying flame across the burning area with the extinguisher stream. This is a "Class A" fire—lingering embers might again break into flame when the blanket of inert gas clears away to admit fresh air. To complete the extinguishment, use water. Dry chemical and carbon dioxide extinguish fires by temporarily excluding oxygen (air) from the vicinity of the fire.

Problem 3. Cool the cylinder and the trailer with a fine spray of water. As soon as the temperature in the cylinder drops sufficiently, the fire will go out, because the escape of gas

will stop. If possible, disconnect and remove this cylinder. Common sense would indicate that no pressure relief valve on a domestic or trailer installation should ever be mounted so its discharge, if ignited, will impinge against any flammable structure.

Problem 4. Stop your truck a safe distance away from the car, and park it clear of traffic. If the gasoline tank of the car should explode, you do not want its effect to reach the truck. Your operating rules require you to have a serviceable extinguisher available at all fuel deliveries. Your extinguisher should be recharged or replaced before continuing with your delivery route.

Problem 5. The problem here is to shut off the fuel between the tank outlet and the pump, and between the pump and the bulk truck, as close to the pump as possible, at the same time preventing the tank from overheating. The man at the pump should

(Continued on page 118)

Problems for Discussion at Fourteenth Safety Meeting

The problems and questions presented herewith may not all fall within the scope of your particular operation, but they relate to a basic understanding of L. P. gas and the principles which make its handling safe in any kind of operation.

For those whose operations are limited to cylinders, without bulk storage or motor fuel uses, there is still much to be discussed. A cylinder is merely a miniature bulk storage unit. It holds the same fuel as the big bulk tank, and is subject to the same physical laws. Knowledge of the requirements for storage and transfer of fuel in bulk give the cylinder operator the basis for safer utilization of the equipment with which he works — and how do you know that you may not some day be working with fuel in bulk?

The problems and questions have been devised to test the understanding of the employee of the nature and behavior of L. P. gas as well as the details of storage containers and the necessary equipment to make their use safe. And the leader of the meeting will always place extra emphasis on those phases which relate directly to the daily experience of the men on the staff. Along with this, it is desirable to present and analyze the problems that have arisen in your own company experience.

Problem 1

A customer has an underground type tank, legally equipped for that service. He wishes to install this tank for aboveground service. Under what conditions will this be permissible?

Problem 2

A bulk truck was involved in a multiple car accident on a highway and turned over, cracking an elbow in the piping system. All the gas in the tank leaked out, and nobody was hurt, nor was there any fire, although traffic had to be diverted for six hours. Why didn't the excess flow check valve stop this leak? If it had been possible to get to the truck without entering the gas-filled zone, how could the excess flow valve have been closed?

Problem 3

You are waiting on the public at a cylinder filling plant which does a considerable business in filling trailer cylinders on a "cash and carry" basis. A customer brings in two cylinders, one an ICC 20-lb. bottle, the other a roughly welded affair with no manufacturer's markings, and only a plain POL valve without a pressure relief. When you question the advisability of filling the latter, the customer says that both tanks have been filled many times, and nothing has ever happened. What do you do?

Problem 4

In your cylinder filling operation you find an old cylinder that has been "modernized" by installing a POL valve with a built-in pressure relief. On inspecting the bottom of the cylinder, you find three fusible plugs. What do you do?

Problem 5

The driver of a semi-trailer transport truck fell asleep at the wheel. The rear wheels of the trailer struck a concrete culvert, knocking the axle from under the trailer. The outlet pipe of one tank was knocked off, damaging the threads at the tank end of the joint. The excess flow valve prevented loss of the cargo, but examination showed that it would be necessary to weld a new outlet connection into the tank. How would you get the cargo out of the tank? How would you make the tank safe for welding? How would you make sure that the repaired tank was safe for further use?

Questions

1. Is it permissible to mount motor vehicle fuel tanks with the valves in any other position than that for which they were originally intended? Why?
2. Why should cylinders be transported and mounted for service in the upright position?
3. What is the procedure of opening an excess flow valve that has closed because the outlet valve has been opened too quickly? What is the proper method of opening an outlet valve, so the excess flow valve will not close?
4. In filling a tank equipped with magnetic gauge, what precaution should be taken against possible overfilling?
5. Why is a tank thermometer placed in a well filled with other fluid, instead of being inserted directly into the liquid in the tank?
6. Which openings in a bulk storage tank are required to have double valve equipment?

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At Consolidated, management doesn't "boss" ...IT LEADS!



Uniform policies and procedures enable Consolidated's management to control operational expenses to a maximum degree for more profits. This interior view of Consolidated's Montezuma Division Office shows the cheery atmosphere which inspires efficient work from all personnel.

By Alex W. Bealer, III

TO MANY people management seems to be synonymous with "Brass Hats." In smaller companies management is often so involved in the details of accounting, sales, service, and delivery that it is usually difficult and unnecessary to look upon it as a separate function. At Consolidated Gas Co., Atlanta, Ga., however, management is neither made up of brass hats nor is the group at all insignificant in the operation of the business.

The management of Consolidated has one responsibility and that is to manage. And in an organization which has faced the complex problems of Consolidated, management cannot carry out this responsibility

by relying on its position to boss. It must **LEAD!**

To understand the absolute necessity in this large company for management which actually manages, one must realize that Consolidated's methods of formation and organization are without precedent in many ways, not only in the LPG industry but in American business as a whole.

Consolidated Gas blossomed overnight as one of the largest LPG dealers in the country. The spectacular debut was not accomplished, as in most cases, by one company using a large block of capital to buy out several other companies outright. In the case of Consolidated, five successful dealers in Georgia decided to literally consolidate their stock, personnel, customers, and equipment. The man-

aging groups of these five independents were also consolidated, and each of the managing principals soon found that his problems were five times as big as they previously had been. Each, however, had five times as much experience to draw on in solving these problems.

All the experience that could be mustered was needed to coordinate five efficient and successful companies, each with a different fiscal year, different equipment, sales methods, products being sold, and general policies in regard to personnel and operation, without destroying the efficiency of each. In fact, efficiency of all segments had to be increased or the value of consolidation would have been lost. The problem faced, then, was how to apply uni-

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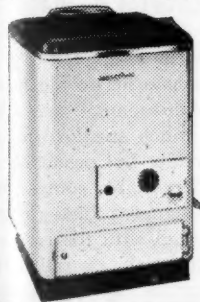
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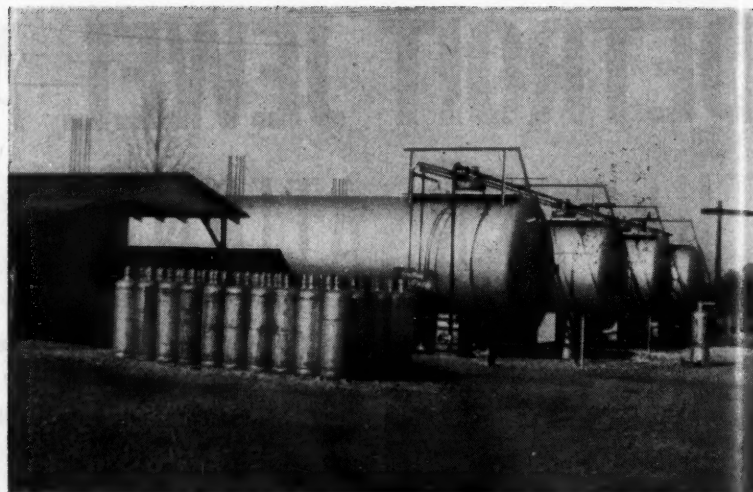
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Adequate modern equipment is one of the responsibilities of Consolidated's management. This shows the bulk plant of the Atlanta Branch Office, largest local office in the company.

form policies to all five divisions of the new company without losing the efficiency gained through preconsolidation policies.

Such a poser could not possibly be conquered by the employees and local management of Consolidated, because, even though both groups made admirable contributions to a solution, each had to concentrate on day-by-day operation to assure that no ground was lost during reorganization. Top management was left holding the bag, in a position which offered no precedent to make the job easier.

Eighteen months after Consolidated Gas Co. had its inception, however, its management has demonstrated that the basic problems have been thoroughly licked. Efficiency as well as profits have increased and Consolidated has started a period of expansion. For this success, the company's management can take a well-deserved bow. To really appreciate the credit due management though, it must be understood that, while the fundamental organization of the company's management follows tried and true lines, many aspects of this organization had to be unique in order to face a unique situation. This can best be described by starting at the top of the management echelon.

As in all companies, Consolidated's management actually starts with its owners. Consolidated has about 300 of them, the majority of whom have shown unusual interest in the fortunes of the company. No one person holds a controlling interest of stock,

even among the former owners and executives of the five separate dealers.

In most cases, stockholders in a company seem satisfied to let the company take care of itself, but this is hardly so in the case of Consolidated. The first demonstration of this almost personal interest on the part of stockholders was when Consolidated stock was initially placed on the open market. Every share was sold the first day the stock was available, and stockbrokers had to limit the number of shares sold to individuals in order to partially satisfy the demand among prospective buyers.

An even more unusual demonstration of interest by owners was shown a few months after the stock issue. At the first stockholders meeting of the new company, over 95% of shares were represented, either personally or by proxy. In this meeting the owners, then, took a personal part in decisions which affected the future of the company.

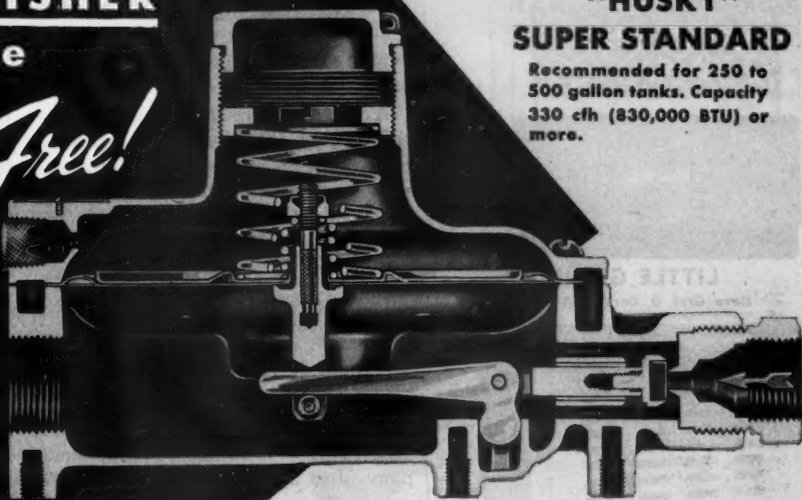
In a company large enough to pay regular dividends to 300 people, however, actual management must be carried on by much smaller groups than the ownership. In Consolidated, as in most other sizable companies, owners have designated these groups which are charged with the responsibility of managing the overall operation so that a profit may be realized on the owners' investment. These groups are the board of directors, the executive committee and the department heads.

Of course, Consolidated's board of

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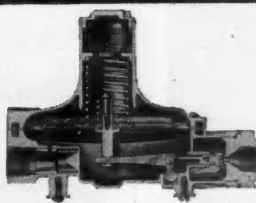
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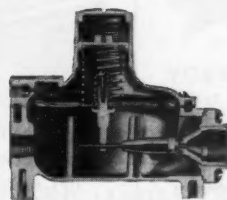
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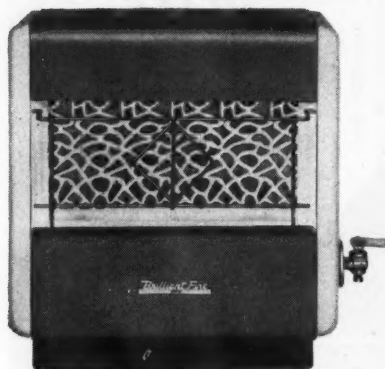
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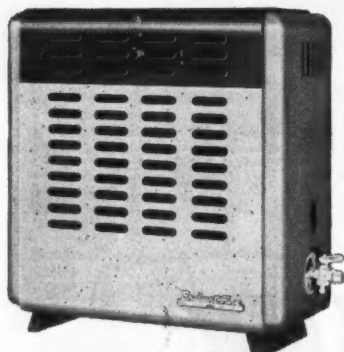
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directors is closest to ownership, being elected at stockholders meetings and responsible for reporting the affairs of the company to its owners. Directors consist of stockholders, all of whom are familiar with the problems and possibilities of the LPG business, members of the executive staff, and members of local management. Thus, in all matters that come before the board, the interest of owners is represented, as well as the operational problems and limitation encountered throughout the company organization.

A board of directors composed in this manner, then, is splendidly fitted to carry out its prime function: to provide *direction* to the activities of the company.

However, a board of directors which has been given responsibility to direct complicated activities of a large company, yet has been given no authority with which to follow up its directions, would be well-nigh useless to ownership. Accordingly, Consolidated's board is authorized to appoint the executive committee of the company. Just as its name suggests, the executive committee has been charged with *executing the directions* of the board so that interest of owners will be adequately cared for. It reports to the board, and acts through department heads.

The executive committee of Consolidated Gas Co. is probably the key to the company's success. Its com-

position reflects the experience and obligations of each of the five former independent dealers who became Consolidated Gas Co. Being made up of the heads of the five former companies, it is the only type group that could possibly cope with the complicated questions of retaining former efficiency in each of the five divisions through old methods and at the same time applying new methods to all divisions which would increase efficiency and profits.

Another secret to the accomplishments of the executive committee is that its members are each charged with specific responsibility in the four departments of the company. This may seem rather strange on the surface—much like a man giving orders to himself; but it is not. The synonymy of the two groups is only partial, and an examination of the duties and qualifications of the executive committee members will do much to point out the value of the arrangement.

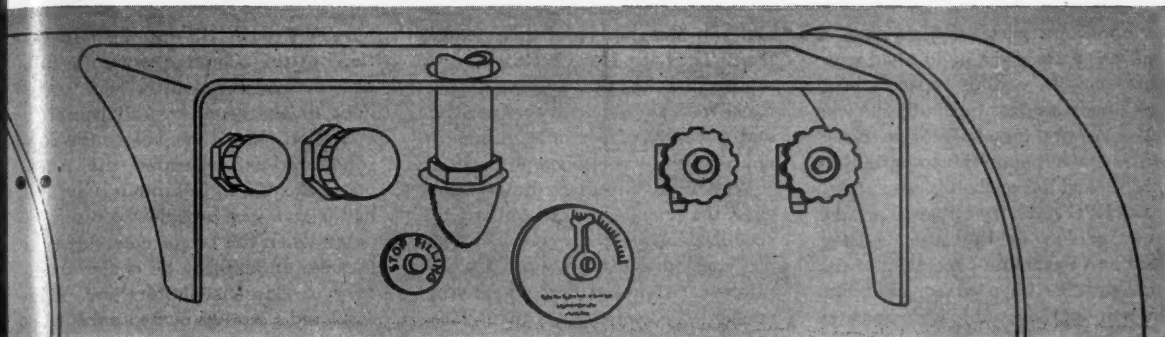
The company's president, Hermann Paris, has a double responsibility. His position requires him to preside over board meetings and executive committee meetings. He coordinates the workings of the two top management groups and sees that the directions of the board are acted upon by the executive committee through department heads and local management.

Mr. Paris is eminently qualified for



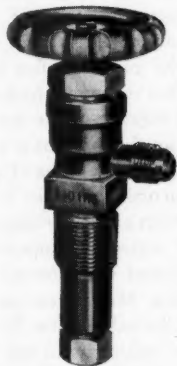
Consolidated Gas Co. recently opened its 27th branch office in Carrollton, Ga. Jack Thomason, former manager of the La-Grange branch, heads the staff at Carrollton. Previously, the

area was served by the Atlanta branch. Now, with a new modern showroom, office, warehouse space, bulk storage, and rail siding, more efficient service can be offered customers.



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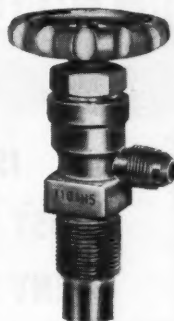
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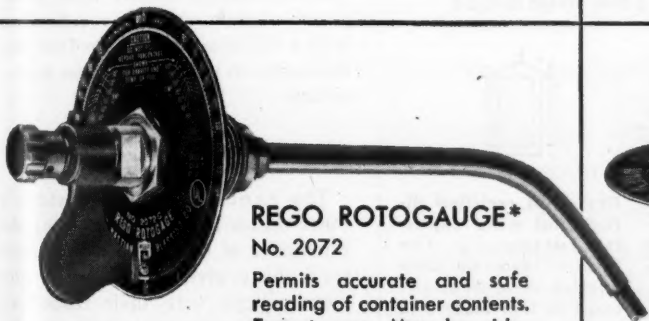
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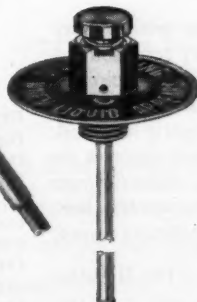
Full opening and positive shut-off with leak-proof diaphragm construction for long, trouble-free service. $\frac{3}{4}$ " NPT inlet, $\frac{3}{8}$ " SAE flare outlet. Built-in integral excess flow valve for added protection.



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of DENVER—Denver, Colo.
A. C. PINK, S. A., Mexico, D. F.
EMPIRE BRASS MFG. CO., LTD.
London, Canada

The **BASTIAN-BLESSING** Company

4201 W. Peterson Ave., Chicago 30, Illinois

**PIONEER AND LEADER IN THE DESIGN AND
MANUFACTURE OF PRECISION EQUIPMENT
FOR USING AND CONTROLLING LP-GASES**

his important post for a number of reasons. First of all, he has had wide experience in various types of business undertakings. Secondly, he was one of the first men in Georgia to recognize and act upon the potentialities of LPG, and has probably been active in the LPG industry longer than any other person in the state. Lastly, Hermann Paris first conceived of the opportunities open to consolidation and pointed them out to his associates in such a manner as to produce an enthusiasm which is greatly respon-

sible for the success of their experiment. Thus Mr. Paris is able to carry out his double duties successfully because of comprehensive experience and a wealth of personal interest in applying this experience properly.

With such important duties, however, the president of a company the size of Consolidated Gas can hardly be expected to also personally supervise every detail of the company operation. To help the president carry out his duties, therefore, the executive committee some months ago ap-

pointed Fred A. Rives to be "Mr. Action" of the company, with the title and duties of executive vice president in charge of overall company operation. Mr. Rives before the consolidation had operated the Automatic Gas Co. in Columbus, Ga., and had been a vice president of Consolidated when the larger company was formed. In addition he is also president of Gas Distributors Inc., Consolidated's wholly owned subsidiary distributing organization.

Mr. Rives, being admirably suited by experience and temperament to handle his big job, has done much to organize the problems first faced in the consolidation, and to suggest action whereby they could be easily and quickly solved. One of his first acts was to carefully delegate responsibility for various phases of company operation to management right on down to the branch office level. Then, to give his managers and associates definite objectives, he worked out a formula for the amount of profit to be expected on all phases of operation. This furnished all levels of management with a specific check for profits on all aspects of operation. Not being satisfied with merely furnishing an idea, Mr. Rives takes a great deal of valuable time to visit branch offices regularly to see that they understand exactly what is expected of them and to provide them with a full measure of help from top management in fulfilling these expectations.

Other Duties of Vice President

The executive vice president's other duties include seeing that the remainder of the executive committee is able to give full support to company policies with their respective specialized activities, which consist primarily of finance, purchase, sales and delivery of gas, sales promotion and advertising, and operation, this last including sales and service. The fact that he runs into no trouble in carrying out duties which normally could become very complicated from the standpoint of personalities is a further indication of the wisdom behind Consolidated's executive organization. For each of the policies suggested by the executive vice president must be passed on by the executive committee before action can be taken. Since members of the executive committee are responsible for

FIELD TESTS PROVE THE

BREIDERT AIR-X-HAUSTER

(Pat. No. 2269428)



IS THE MOST EFFICIENT VENT FLUE CAP ON THE MARKET



Safe, sure ventilation no matter which way the wind blows . . . The Breidert represents a revolutionary, aerodynamically-correct principle in design that makes it especially suitable for venting gas heaters and other appliances. Properly installed, the Breidert *cannot* back-draft where there is no interior negative pressure! *In recent exhaustive tests by the U.S. Government, Breidert Air-X-Hausters out performed all other types of ventilators tested.*

Reduces service to a minimum . . . The Breidert is stationary, has no moving parts to jam or get out of order. Instead of exhausting soot and fumes *downward* as most conventional ventilators do, the Breidert vents *to the sides*. Thus, the flue stack and roof remain cleaner, and without discoloration.

A few words about cheaper caps . . . You may buy lower cost vent caps than Breiderts, but the necessity for special service work to make them operate properly may cost you \$10 to \$25 additional.

First with certified directional wind capacity ratings . . . The Breidert ventilator offers *certified* capacity ratings based on tests made with wind blowing at *all* angles (as shown). These high capacities were proved and certified by Smith Emery Co., Pacific Coast branch of Pittsburgh Testing Laboratories. *Insist* on certified ratings based on directional wind tests at various vertical angles as shown in considering any ventilator.

Send for literature and Installation Guide. No charge or obligation.

G. C. BREIDERT CO. Dept. BP. 3129 SAN FERNANDO ROAD, LOS ANGELES 65, CALIF.
REPRESENTATIVES IN PRINCIPAL CITIES OF THE U. S.



Paul LeMay

...thrown

Every business is thrown when it fails to receive quality product at a competitive price. Stay in the saddle by becoming a customer of the Sid Richardson Gasoline Co. and be assured of a dependable, year-round supply of top-quality LP-Gas at a favorable price.

Sid Richardson Gasoline Co. customers get these extras:

1. Segregation of tank cars to protect quality
2. Underground storage for assured delivery in winter as well as summer
3. A savings plan that lowers the cost of product through earned bonuses

Plus — assured co-operation at all times because we have no company-owned wholesale or retail outlets competing with our customers for new business or for their LP-Gas supply.

Write, wire or telephone for complete information.

Sid Richardson

GASOLINE CO.

629 FORT WORTH CLUB BUILDING • FORT WORTH, TEXAS

the work of department heads, once a decision has been made by the committee its support from departments is a matter of fact.

Mr. Rives is assisted in carrying out his multiple duties by Sidney L. Stapleton, general sales manager, whose initiative is seen in every phase of company operation. Mr. Stapleton, recently elected a director of the company, is considered an ex-officio member of the executive committee also.

Vice president in charge of sales promotion, advertising and the new

sub-dealer program for Consolidated is W. B. Wight, who operated Consumers Gas Co. of Albany. Mr. Wight's job is to see that sales for the new, larger company have adequate support at all times. It has taken some doing, as was described in an earlier article in this series, but sales have steadily risen and profits along with them since the consolidation, when Mr. Wight took over. He is ably assisted by Earle Harrison, who has developed and maintained the sub-dealer program, an idea which is already paying big dividends.

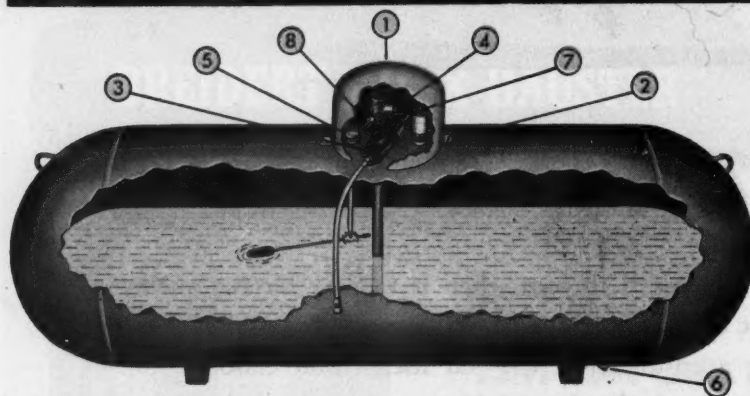
Gas purchase, delivery and sales, which are essential to hold the important core of regular customers, are the responsibility of Claude G. Haugabook, vice president, who managed the Economy Gas Co. before consolidation. Gas delivery and service above all had to be reorganized to meet the demands of a larger operation, where each small example of inefficiency was multiplied five times after the advent of Consolidated Gas Co. Carl Coslick, department head for this activity, has instituted uniform policies among his group and has started a training program which was unnecessary for a smaller business, but is already showing additional profits for Consolidated.

The last of the special responsibilities are the province of B. T. Nightingale, Consolidated's secretary and treasurer. Mr. Nightingale presents the figures that show whether profits are being made or not. This in itself is a big job, but there's more for Mr. Nightingale. For instance, when Consolidated put its stock on the open market, he had to take care of all the exacting details, including registration after the sale, and seeing that dividend checks were promptly mailed. In addition, the secretary and treasurer has had charge of working out a complete program of hospitalization and group insurance for all of Consolidated's employees, a program that has helped convince everyone in the company that consolidation pays off. Details of a new accounting system designed to fit overall needs were worked out by John E. Lewis, accounting department head.

This is, then, briefly the management of Consolidated Gas Co. The important point to remember, however, is that the efforts of the men concerned have been welded together as well as the properties of the five companies before consolidation. It is through unified efforts that management has been able to inspire the combined cooperation of all the personnel of the company.

It all goes to show that a job should never be done half-way. If you plan to consolidate, be sure you consolidate everything that may influence your success: material, customers, personnel, effort... and most important, spirit. That is a precedent which Consolidated Gas Co. has proved successful.

Economy LP-GAS SYSTEMS



Some of the many Features and Qualities of Economy Systems

- ① ONE PIECE STREAMLINE DOME!
- ② STURDY DETACHABLE HINGE!
- ③ LARGE ORFICE REGULATOR!
- ④ LIQUID TAKE-OFF, BUILT-IN EXCESS FLOW!
- ⑤ FLOAT GAUGE, REPLACEABLE SNAP-ON DIAL!
- ⑥ BOTTOM PLUG FOR LIQUID, OR CLEAN OUT!
- ⑦ LIQUID LEVEL OUTAGE GAUGE!
- ⑧ PRESSURE GAUGE OUTLET!

SEE US BEFORE YOU BUY!

Economy Truck Tanks, Transports, Skid Tanks, Anhydrous Ammonia Tanks and all types of Steel Fabrications.

VICKSBURG TANK COMPANY, INC.

409 LEE STREET • VICKSBURG, MISS.



*In all
these
magazines,*

TAPPAN TELLS 'EM TAPPAN SELLS 'EM

...to boost your LP gas range profits

Your customers know and want Tappan...the modern LP ranges. In America's top magazines...on top network television...Tappan demonstrates the up-to-the-minute features women insist on today. What's more,

through strong merchandising and promotional programs...geared for the LP market...Tappan helps you ring that cash register.

Tie-in with Tappan for top profits! Sell the ranges your customers are sold on. Sell the complete TAPPAN LP line!

*The TAPPAN Stove Company
Mansfield, Ohio*



By James MacKrell
Mandeville, Louisiana

PART 2

● Prospects and Gold

How To Make A Success As An LPG Salesman

FROM the earliest recorded times until the present hour men have been fascinated by the lure of gold. How many have lost their lives in its search we'll never know. From the old gold-mining prospectors we get our modern-day word, prospects. It's the unknown, the lure that drives good salesmen on—the next call may be the one that produces a sale—and salesmen have always found their best sales in the most unexpected places.

Let me tell you a true story.

When the '49 gold fever hit America and the rush became a trek to California, there were two poor brothers, Ebe and Zeke, on an Indiana farm, also hankering to go find their fortune.

In my mind's eye I can see them talking it over while sitting on the back steps of their farm home. I believe Ebe said, "Our neighbors are all making plans to leave and soon it looks like we will be left here all alone, because we don't have the money to go." And I believe Zeke answered something like this:

"No, we don't have the money to buy an outfit, but we do want to go. We're strong, we've got a good blacksmith shop and woodwork shop,

we've plenty of oak, ash, and hickory on the place, we've got two good teams that are young and strong. We can sell the livestock and get enough cash to make the trip, so let's build our own wagons and make them stronger and better than any store-bought wagon in this country."

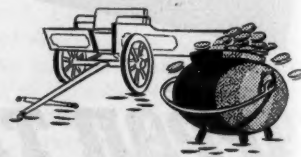
And I believe the next day they started to work, felling the trees, cutting them up into lumber, stacking the planks and timbers just right so the sun would dry them straight and strong.

Of course, I don't know what they talked about during those months of waiting, but I do know the day came when that first wagon was completed. It was the prettiest, the lightest, and the strongest wagon ever made in America, and I do know that Ebe said to Zeke, "Zeke, it's so pretty let's paint it, the wheels and running gear red and the body green." So they painted it.

Their next-door neighbor also had the gold fever, and he was prosperous. When he saw the shiny new wagon, he said, "Boys, they don't make a wagon anywhere in America as good as that. I had intended to pay \$50 for a wagon, but if you boys will sell me that one, and you have

plenty of lumber to build yourselves another one, I'll pay you \$100 in cash."

Ebe and Zeke thought that one over for a few minutes. They both knew that \$50 would buy a wagon at any carriage shop. After all there was enough lumber already dried, and it wouldn't take them too much longer so—why not?



Well, the true story is that before the second was completed they had sold it for another \$100, and received orders for at least a dozen more. Men were employed to fell the trees and cut the lumber, and green wagons with red wheels and running gear were steadily rolling out of that farm yard. And, they kept on rolling for several years until the neighbors began to trickle back home, tired, broke, and disillusioned, while Ebe and Zeke had more money in the bank than they had ever dreamed

Largest Selling Brand of LP-Gas in America!



Write for additional information.



CASH IN ON THIS 5-WAY PROFIT PLAN!

1 HIGH QUALITY PRODUCT.

The name "PHILGAS" guarantees a uniform gas produced by improved fractionation methods under Phillips rigid standards of quality.

2 DEPENDABLE SUPPLY.

Ample storage facilities . . . modern transportation by pipe lines, trucks and tank cars, assure prompt, dependable deliveries.

3 EXPERIENCED ENGINEERING.

LP-Gas specialists, trained in the field, advise Phillips-contract bulk plant operators on economical plant design and safe, efficient equipment.

4 EFFECTIVE MARKETING

HELP. Philgas is a famous brand name . . . the most advertised LP-Gas brand in America. Advertising is scaled to fit your needs. Practical promotional material is available to Phillips-contract customers.

5 OPERATIONAL ASSISTANCE.

Phillips-contract customers keep up-to-date on latest improvements in equipment, newest safety measures, most efficient and economical distribution procedures, by means of Phillips bulletins and information service. Phillips also provides advice on special operating problems.

PHILLIPS PETROLEUM COMPANY

Sales Department



Bartlesville, Oklahoma

of with orders always ahead of production.

It was a spring day when Ebe said to Zeke, "They are so pretty, let's put our name on them," so on each side they wrote the single word "Studebaker" and Studebaker wagons are still rolling across the highways of the nation. Their success: they didn't miss a single sale because they didn't miss a prospect.

And instead of going 3000 miles from home, they found **THEIR GOLD** right in their own community.

Every Person a Prospect

Every living human is a prospect for something.

Think that one over a moment. Every living human is a prospect for something from a day old infant, who can voice his wants for a bottle only by a plaintive cry, to the aged, who will probably buy next a cemetery plot. All in between, all ages, have something they intend to buy next.

The good salesman is the incessant salesman; every time he talks with a person, he's selling. He regards

every pair of eyes he is looking into as a potential customer, because he never forgets that, in all ages, everyone he sees intends to buy something—next.

In the LPG industry there can be **NO SATURATION** point.

Remember well, in this industry it is impossible to reach a saturation point in our lifetime.

Government statistics prove that there are 7000 new mouths to feed every morning, which means that in the next 22 years at the present rate of births over deaths, our population in these United States will have increased 25% by 1975.

More young married couples are starting new homes every day; more older married couples are moving out from the cities to the suburban areas and this trend is nationwide.



Ways To Develop Prospects

Advertising in the LPG industry usually follows this pattern in importance:

1. Radio.
2. Newspapers.
3. Direct mail.

Other methods of getting prospects are:

1. From employees.
2. From old customers.
3. Cold canvassing.

Let's examine this a bit, and do some analyzing.

1. Radio advertising.

It has been a rare privilege for me to grow up in the era of radio. When I first started broadcasting, it was with a crystal microphone and earphones before loudspeakers were available.

I've sold several millions of dollars worth of merchandise to people I'll never see. These years have taught me a valuable lesson. It is this: when you say something on radio, even though you have a hundred thousand listeners, just remember they are all listening, one by one, unconscious of the fact that anyone else is listening.

Knowing this puts a definite some-



If you want Faster Filling plus Added Safety ... specify Superior 1045

Superior's new 1045 bulk storage tank valve incorporates all of the operating and safety features that make for fast, safe filling. Here's why:

- Standard shut-off valve with POL outlet, 1/4" inlet
- Both spring loaded and fuse metal safety devices
- Standard filler connection (1 1/4" Acme thread)
- Design insures rapid filling rate
- Cap with synthetic rubber gasket for secondary seal
- Fixed liquid level gauge
- Finger operation on knurled nut for volume filling

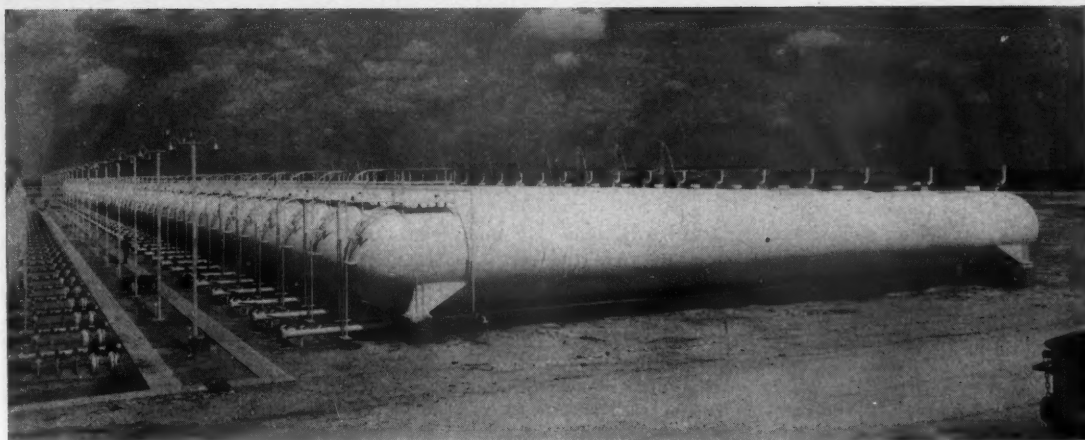
You can rely on Superior's
Symbol of Safety



Superior valve & fittings company



1509 West Liberty Avenue
Pittsburgh 26, Pa.



Major Refiner Buys 65,000 Gallon LPG Storage Tanks From McNamar

This purchase of battery of large storage tanks by billion-dollar oil and refining company is proof that McNamar can supply any size LPG tank you want.

Whether it's a 115 gallon domestic system or a 6000 to 30,000 gallon storage tank, McNamar can always meet your requirements . . . for size . . . quality of workmanship . . . speed of delivery.

● Reasons Why Your Next Tanks Should Be McNAMAR'S



1. McNamar's are UL approved Tanks.
2. They meet all requirements of all states.
3. McNamar's are built under the new ASME code.
4. They also meet all requirements of the old ASME U-69 code.
5. McNamar's are X-rayed to meet the requirements of the new ASME code.



*f.i.t. rates apply on
all shipments from
McNamar.*



*Now! McNamar stands on its record of
performance. When you buy McNamar,
you've bought the best tank money can buy.*

Anhydrous Ammonia Tanks Also Available in Standard Sizes



McNAMAR
BOILER & TANK CO.
BOX 868 • TULSA, OKLAHOMA

thing into your radio message that sells. Your listener, not listeners, feels that you are speaking directly to her and no one else. If you remember this, your radio program will sell for you.

One day last year we decided to sell some trade-in ranges. We put a selling price of \$50 on each range. We had enjoyed a very successful Tappan sale for the past two months, so we had a large number of used gas ranges of practically every make and model. I did not mention a single make. I simply said, "I know that

someone this afternoon—listening to me right now—needs a good gas range, and I believe that someone is YOU. Now, if you need a good gas range and you can't afford a new one, we have ONE and only ONE for you. It is porcelain finish, it has four burners on top, a good oven and broiler, and it will give YOU many years of service. And the best part is it will cost you just \$50. It won't last long—first come first served—so be sure to come in right away because a bargain like this won't wait." I repeated that for five consecutive days, and we

sold them all in that one week.

This personal approach sells lots of new customers. I could write many books giving illustration after illustration of where hundreds of thousands of dollars worth of tanks, ranges and refrigerators were sold by our daily radio program.

2. Newspaper ads and direct mail. This type of advertising is so intricate in technique that we can't go into it here, and it is best handled through an advertising agency. But let's take a look at three methods of developing prospects which any LPG salesman can use daily.

First, your fellow workers, the gas salesman, the office personnel, the wives.

Whether you are a part of a corporation or a small one-man company the principle is the same. Any company is only as successful as its sales personnel is prosperous.

Any company that seeks to hinder, hamstring, or retard the prosperity of its sales force is doomed to failure. Any company that believes its sales personnel's earnings should not pass a predetermined amount is doomed to failure.

Gas Salesman Can Help

Take a look at your gas salesmen. They usually see the customers at least once each month. It's easy for them to dig up prospects for you. Sure, you sold them a tank, a full tank of gas, one outlet and a range.

But the gas salesman, whose job it is to keep that tank full, knows, or should know, when the customer is ready for space heaters, a hot water heater, a refrigerator, or a washing machine.

It's up to your company and it's up to you to keep him forever hustling prospects for you.

Most companies that I am acquainted with give their gas salesmen 2½% commission on all the prospects that are sold after they turn in their names, addresses, and what they want. It's certainly worth \$25 for \$1000 worth of business you wouldn't otherwise get.

If it isn't your company's policy to do this, then it's good business for you as a salesman to do it. If you make \$100 commission on \$1000 worth of business that you did not have to hunt out and sell, surely you can afford to pay someone part of the commission.

**PICKUP MOTOR FUEL TANK
WITH THE BONUS OUTLET**

This specially designed tank can be installed in any model pickup in FIFTEEN MINUTES. The Bonus Outlet permits simple hookup for weed burners, branding irons and camp stoves without disconnecting a single valve.



All of the production facilities of the Western Tank & Steel Corp. are devoted to the manufacture of custom-tractor and motor fuel tanks. Because they are a main-line and not a sideline, you can rightfully expect a product with superior quality and extra features, such as the bonus outlet. Write for further information and prices today.

Regional distributorships are still available in some areas.

**WESTERN TANK
& STEEL CORP.**

Phone 5-7517 P. O. Box 1013 Lubbock, Texas

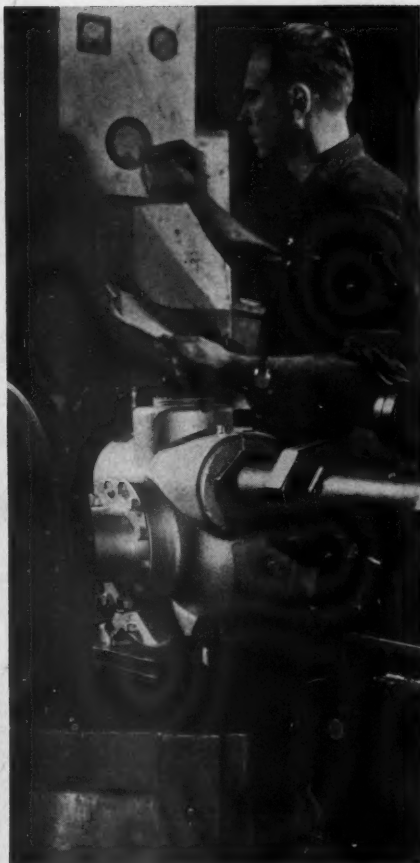
EVERY SMITH PUMP MUST PASS ALL THESE TESTS

BEFORE IT CAN BE SHIPPED

MUST

- deliver more than rated flow at higher than rated pressure (lower left).
- be leak-proof under 200 lbs. compressed air pressure when submerged in solvent. This test reveals any flaws in threads and joints, as well as in the castings (center).
- conform to rated power requirements. Any small bind or tightness caused by clearance irregularities will cause pump to draw too much power (upper right).
- have gears X-rayed for hidden flaws that cannot be detected in other inspection.
- be clean and free from all foreign matter. Immediately after testing, pumps are filled with new, clean oil and plugged to prevent rusting and entrance of dirt during shipment and storage (lower right).

All of our repaired and replacement pumps must pass the same tests as new ones. You can count on good performance from the Smith Pump you buy, if it is properly installed.



SMITH

PRECISION
PRODUCTS
COMPANY

1135 MISSION ST.,
SOUTH PASADENA, CALIF.

PHONE PYRAMID 12293

Then think of the office personnel. Someone in the office handles the monthly payments. If the order is for 24 or 36 months, the office personnel will probably see your customer 24 to 36 times before you will. As he or she is writing the receipt it takes just a moment to ask, "Are you ready for those space heaters? How about hot water, do you have your hot water heater yet?" or "Isn't it time for you to get your new washing machine?"

If the customer says yes, if the of-

fice personnel gives you their name and address, and if you sell this additional appliance, the 2½% commission is very cheap selling, isn't it?

One LPG salesman I know very well carries quite a few premiums with him in his car. He makes a practice of buying the premiums out of his own pocket at an average of one dollar each. He specializes in nylon hosiery, costume jewelry, bath towels and linens—things most women use every day. These giveaway premiums cost him from \$75

to \$100 a month out of his own pocket. And what is his return on this investment? Well, month in and month out this salesman sells from \$9000 to \$12,000 worth of equipment per month, which means his commission check is from \$900 to \$1200 a month. So his premium investment pays off pretty good. And who does he give the premiums to? The wives of the employees who turn in prospects that he sells.

There is a hit and miss way of selling, and there is a scientific method of never missing a good month's work.

Let's consider the field of "old customers."

1. You can re-sell old customers additional appliances.

2. You can get old customers to work for you.

Let's talk about "re-selling old customers."

Every LPG salesman who is really good usually goes through the company files and makes a prospect card on every old customer who has bought a tank and heaters or a tank and range. He puts on the prospect card the date of purchase and then sets a follow-up date for six or nine months later.

After the six or nine months have passed and the customer's credit has been thoroughly established, the salesman makes a call on this customer. If the customer bought a tank and range, it's time to call back and sell a space heater, a washing machine, a hot water heater, deep-freeze or whatever else they may need and can afford.

This, I think, is the richest gold vein an LPG salesman can find and explore. You don't have to worry about a credit report, you already know the customer is good.

Now, for step No. 2—getting old customers to work for you.

About 18 months ago I sold a bus driver a pretty big order, including a well, pump, bath set, laundromat, tank, range, sink, hot water heater, space heater and a refrigerator. The sale amounted to about \$2800.

I carefully went through each step as outlined in this book. He made the usual down payment of 10% or \$280. Then when he got his book from the finance company and saw what the carrying charges were for 36 months, before the first note was due he came and paid his balance of \$2550 in cash. I stressed again and

Coming Soon! A NEW VIKING

LP-GAS

TRACTOR FUELING

PUMP UNIT

MODEL GG196



Investigate today! Be ready to build steady, dependable business with your farm trade by installing storage tanks and Viking LP-gas pumps for fueling tractors. Every farmer having or considering an LP-gas tractor is a prime prospect.

The new Viking LP-gas farm tractor fueling pump is a compact, 10 gpm unit with pump direct connected through flexible coupling to a ½ H.P., 1750 rpm motor. The repulsion induction motor, ideal for farm circuits, is an integral part of the unit. Pump suitable for differential pressures up to 60 psi.

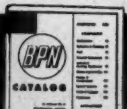
Outstanding features of the pump include a dry-liquid mechanical seal, non-lubricated inner bearing, built-in radial thrust bearing on pump shaft, bypass valve on pump head and safety relief valve on suction port.

GET READY FOR THIS BUSINESS TODAY!

**ALSO IDEAL FOR FUELING
BUSSES - TRUCKS -
TAXICABS - CARS**

For More Information
Send for
Bulletin A2300B.

See our
Catalog
in the



VIKING PUMP COMPANY
Cedar Falls, Iowa

Why Dealers Prefer

AMERICAN

Better-Built

TRUCK TANKS

• **LIGHT WEIGHT**

Highest Quality, High-Tensile Steel

• **HIGH GAS DELIVERY**

Complete Units Feature Exclusive New "HI-FLOW" Style Piping

• **MAXIMUM SAFETY**

To Meet or Exceed All Requirements

• **PERFECT BALANCE**

Two Cabinets in Rear

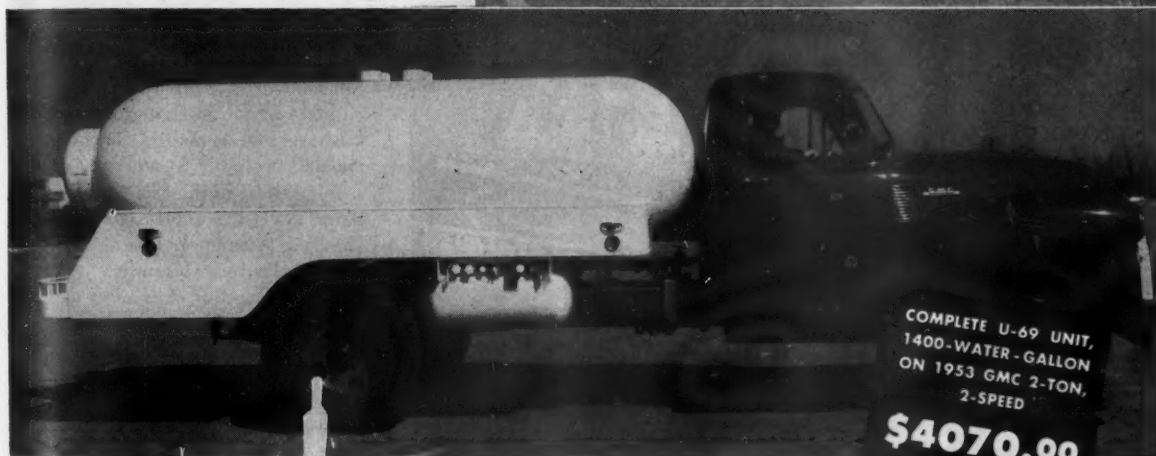
• **LOWER COST**

Compare Prices, Quality

COMPLETE U-69 UNIT,
1400-WATER-GALLON
ON 1953 CHEVROLET
2-TON, 2-SPEED

\$3895.00

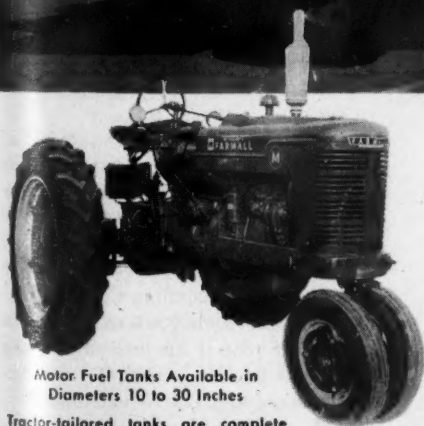
Excise Tax Paid



COMPLETE U-69 UNIT,
1400-WATER-GALLON
ON 1953 GMC 2-TON,
2-SPEED

\$4070.00

Excise Tax Paid



Motor Fuel Tanks Available in
Diameters 10 to 30 Inches

Tractor-tailored tanks are complete
with all necessary mounting brackets.
Replace gasoline tanks. Write for
prices and specifications.

**Budget Financing
as Low as \$974 DOWN to Qualifying Dealers**

These beautifully designed delivery units are
complete, ready for service. Equipment includes
motor fuel tank, 50-foot filler hose assembly;
power take-off; KK-190 Viking mechanical-seal
pump; ICC lights; "HI-FLOW" piping. White
enamel finish.

At Comparable Savings:
"Better-Built" Units
Mounted on Your Own
Chassis—Piped Com-
plete, or Set on Your
Truck Ready for Piping.

This Extra Equipment Available at Low Extra Cost:
Carburetion, Vapor Hose Assembly — Neptune
Meter, Tool and Meter Boxes on Side; Directional
Lights.

Complete Prices, Speci-
fications and Budget
Information Gladly
Sent on Request.



Next Time You're in Dallas Be
Sure to Visit Our Modern New
Plant and Air-Conditioned
Offices on West Commerce.
You're Always Welcome.



American TANK & MFG. CO.

2136 West Commerce • P. O. Box 5525 • Dallas, Texas • Phone RI-9183

again with this customer, whose name was George, that every time he got us a new customer we would give him 25 gallons of gas free.

It happens that this customer has seven brothers and sisters who came in to see and admire his new possessions. So far, we have sold over \$37,000 worth of business from that one sale.

George brought the new customers into our office, told us exactly what they wanted, and all our salesmen had to do was write the orders, col-

lect and spend the commissions. Not one bit of selling did anyone have to do because George did it for us. We have not only kept his tank full of gas for 18 months, but he still has over 200 gallons of free gas coming to him whenever the tank gets empty enough to hold some more. Four hundred gallons of gas is mighty cheap pay for over \$37,000 worth of business.

I believe I could write 10 or possibly 20 large books and fill them with nothing but illustrations of spe-

cific cases like this—cases where an old customer did all the selling for me.

In a small Louisiana town we have an elderly colored woman for a customer. About two years ago she bought a wringer-type washing machine from us.

When she bought the old place where she lives there was already an old underground tank and an old gas stove. But we told Lula our story. If she would "boost" for us, every time we sold one of her friends something she would get 25 gallons of gas free. In addition to the free gas whenever Lula comes to town, she comes by our office to say hello. We always ask her to take a seat and rest a few minutes. We always go next door and buy Lula a five-cent candy bar at the cafe. Just a little act of kindness. Needless to say, Lula hasn't bought one gallon of gas from us in the two years she has been our customer because in the two-year interim we have sold her friends over \$10,000 worth of ranges, washing machines, refrigerators, and tanks. This business cost us maybe 300 gallons of gas and probably \$4 worth of candy.

Regardless of the size of your company, any LPG dealer with just 100 "booster" customers like George and Lula would have it made.

I can make this statement without any fear of contradiction. There isn't an LPG salesman in America today who has begun to scratch the surface in "booster" customer sales relations.

Now, let's consider the cold canvass type of prospecting for customers.

If an LPG salesman cannot get all the calls he can make from the firm's employes, from his old customers, then he can use that old standby of house to house salesmen—the cold canvass. There are several good and easy ways of handling this.

The most lucrative is to drive down EVERY road in his territory looking for just two big items: (1) new construction, and (2) remodeling.

A new home is a cinch for a new tank, several outlets, a new range, a hot water heater, and a bath set, kitchen sink or possibly a pump. A sale to a new home rarely is less than \$1000 and frequently even \$2500 to \$3000. The largest order I've ever written was for a young married couple's new home. They wanted everything—they could afford it, and this one sale was over \$5000.

ORDER O.K. . . . SHIPPING TODAY!



Prompt, reliable delivery usually means the difference between 'profit and loss' for buyers and dealers of LP products. That's why SUNRAY makes a special effort to ship any order — whether emergency or routine — in the shortest possible time.

This reliable service policy, coupled with SUNRAY's controlled, highest quality products, is the reason SUNRAY is continuously adding new customers to its "contract account" list. Protect your 'profit' by ordering from SUNRAY.

WRITE, WIRE OR PHONE . . .



IT'S THERE



WHEN YOU NEED IT

SUNRAY OIL CORPORATION

GENERAL OFFICES

TULSA, OKLAHOMA

P. O. Box 2039 • Long Distance 5-6571

the great new 1954 line of

automatic **ROPER** gas ranges

**IT'S NEW
THROUGHOUT**
NEW SPARKLING BEAUTY
NEW "STYLE-STREME" TOP
NEW BALANCED FRONT
NEW BRIGHT-FINISH
"SPILL-AWAYS"
NEW "EMBASSY" DOORS
NEW "GLAMOR-GRILL"
NEW CONCEALED BURNER TRAYS

PLUS ALL THESE PROVEN FAVORITES

- Wide Selection of Cooking Tops
- Popular "Insta-Set" Control Panel
- "Spectro-Matic" Burner Control
- "Insta-Matic" Oven Guardian
- Precision "Melody" Timer
- "Roper-Glo" Broiler Burner
- Comfort-Level Broiler
- Famous "Bake-Master" Oven
- And Many Others



Built to "CP" Standards

*yours to sell
at a profit!*

Designed to give you many plus benefits in today's competitive market, the beautiful new ROPER models provide feature after feature that your customers want. Here is a long line (includes 20", 30", 36", 40" and 60" models)... a diversified line that provides the ideal answer to most every situation. Ask about ROPER Gas Ranges and ROPER "Dry-Aire" Gas Clothes Dryers, too.

GEO. D. ROPER CORPORATION
Rockford, Illinois

Sales representatives in
principal distribution centers

BPN 2
I'm interested in the Roper franchise. Send me complete information about its availability in my community.

Company Name.....

Individual's Name.....

Street Address.....

City.....

State.....

The story is almost the same on homes being remodeled. Talk about a gold mine, this is it. Regardless of where you are driving or when—whether it's to see a prospect who has telephoned the office and asked you to call or whether you are driving your family on a Sunday afternoon outing—keep your eyes alert for new buildings and buildings that are being remodeled. If you can get there first and stake your claim, you have hit pay dirt.

If an LPG salesman tries to oper-

ate without a prospect file he might just as well quit now, for he is going to be fired pretty soon anyway.

You need a card index with enough space for at least three months. This is a detail that is tiresome to many would-be salesmen but such details pay off in large commission checks.

One of the best LPG salesmen I have ever known carried at least 40 to 50 blank prospect cards with him every day in his left pocket. As he made his calls he always managed to "cold canvass" the house next door,

or the next house down the road.

If the call turned up a prospect for any of the products or services he sold, he filled the card out right there and put it in his right-hand pocket. That night when his day's work was over he filed the card under the date he was to see them again.

Then he always took from the file the cards he was to see the next day. After being in this business for a year he always had at least five good prospects he had every reason to believe he would sell that day.

Needless to say, his installations never went under \$10,000 a month and they often ran to \$16,000.

All he ever sold before he came with us was debit insurance. After he had been with us for three and one-half years his commissions enabled him to trade in a Chevrolet each year on a new model. He had a nice 5-room frame house, and it was filled with every modern-day convenience. On this particular payday he asked me to go with him to the bank. He deposited \$200 in his checking account and \$100 in his savings account which brought his total to an even \$16,000 saved over and above all living expenses for the three and one-half year period.

Mail Out Follow-Ups

Each morning the first chore at the office for every LPG salesman should be the mailing of some type of follow-up. Just take a small card and write the prospect you called on the day before a short personal note thanking them for talking with you. You may rest assured that in addition to talking to you, probably four or five other salesmen called at that home, and it's a 100 to 1 shot none of them will write your prospect a personal note of thanks for her time. This one little act will indelibly fix you in her mind forever.

A new salesman just starting or an old salesman who is just starting to sell right will have to "cold canvass" at least a month to build up his file to where he can pick his day's work and have reason to believe he'll have a good day.

But after one month's serious "cold canvassing" he will have sufficient prospects' cards in his file to assure him of at least one good sale every day.

REMEMBER, nothing is work unless you had rather be doing something else!

APPEARANCE is an asset, too!

Truck Delivery or Domestic Storage Tanks

built by

BAGWELL-GENERAL

LOOK GOOD! SERVE BETTER! ARE BEST!

- TWIN OR SINGLE BARREL
- LIGHT WEIGHT
- LOW COST
- FULL OR SEMI-STREAM-LINED



1250 to 1450 W.G. Full Streamlined
Single-Barrel

Appearance *does* make a difference!

The skillful engineering design and fabrication experience that goes into every BAGWELL-GENERAL Tank Unit combines "eye appeal" with the other advantages you need for economical, safe, dependable operation. We're specialists in building units . . . and we can also serve as advisers, too, if you desire. Our suggestions may be profitable to you, or we will build exactly to your specifications.

Call, write or wire us for the solution to your next tank problem.

BAGWELL-GENERAL

Write
P. O.
Box 391

STEEL CO.

SAPULPA, OKLAHOMA

Telephone
Sapulpa 2680
Tulsa 50-8500



MEMO

For accurate, extra
service L P gas meters
and regulators—
— see the

Sprague
Combination
Meter
and
Regulator



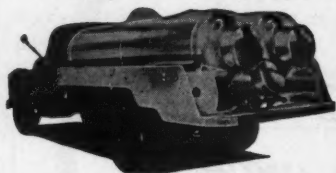
HOUSTON, TEXAS
LOS ANGELES, CAL.
DAVENPORT, IOWA
SAN FRANCISCO, CAL.

THE SPRAGUE METER COMPANY
BRIDGEPORT 4, CONNECTICUT

WORLD'S FINEST PROPANE DELIVERY UNITS

At New Lower Prices

Federal Tax Paid
Easy Terms Available



MODEL 100

New 1954 Chevrolet 2-ton, 2-speed axle, with 1400 W.G. twin propane tank, piped complete — \$3,845.00. With 1954 International L.P.G. factory equipped — \$4,255.00.



MODEL 200



MODEL 300

PACKAGED TRUCK TANK UNITS

Prices include tank, piped complete, Viking KK-190 mechanical seal pump, 50' 3/4" filler hose, clearance lights, tank painted, ready to use.

MODEL 100

1400 W.G.	1600 W.G.	1800 W.G.
\$1755.00	\$1845.00	\$1960.00
Add \$150.00 for Model 200		
Add \$250.00 for Model 300		

We can furnish any make or model NEW TRUCK, including Ford, Chevrolet, G.M.C., Dodge or International (factory LPG equipped), and save you up to \$600.00 on a new truck.

Any make or model pump or meter can be supplied.

New 1954 2-ton Chevrolet, 2-speed, 825x20, 10 ply rear tires — \$2150.00 —

Hose Reels — Fire Extinguishers
LPG Carburetion

SEVERAL GOOD USED
PROPANE TRUCKS FOR SALE
IMMEDIATE DELIVERY



Call
phones 570 or 686
Preston W. Grace

**WHITE RIVER
DISTRIBUTORS, INC.**
Batesville, Arkansas

Association News

Winter Convention Held by Michigan L. P. Gas Assn.

The winter convention of the Michigan L. P. Gas Assn. was held Jan. 25-26 at the Pantlind hotel, Grand Rapids. The program included discussions on "Properties of L. P. Gas," "Burners and Adjustments," "Automatic Controls," "Regulators and Piping," and "State Regulations."

The convention committee, headed by Cal Wright, also arranged for a service clinic designed especially for servicemen for the first day of the meeting. Instructors included W. H.

Guthrie, Frank Henke, M. B. Gault, Ralph Engstrom, Arnold Renner, and William Johnson, all well qualified as instructors for their subjects.

Indiana Dealers to Meet In Indianapolis Feb. 15

The third annual convention and trade show of the Indiana LPGA will be held Feb. 15 and 16 at the Claypool hotel, Indianapolis. The show will feature the exhibit of modern L. P. gas equipment and latest appliances.

Theme of the program is "Profit, Prestige, Pleasure." "Profit" to be made through informative talks and exchange of ideas on conducting an L. P. gas business; "prestige" to be gained as you show your customers you think "enough of their patronage to attend a state-wide show" where newest equipment is displayed; and "pleasure" provided by the good fellowship, good food, and good entertainment planned for the convention.

M. A. Ennis Joins LPGA As West Coast Secretary



M. A. Ennis

M. A. Ennis has joined the staff of the Liquefied Petroleum Gas Assn. as West coast secretary with headquarters in San Francisco.

The West coast office will serve association members in Arizona, California, Idaho, Nevada, Oregon, and Washington. Mr. Ennis comes to LPGA from the National Committee for LP-Gas Promotion, Chicago, where he has served as employee training director since March 1951.

Rochester Chosen for 1954 New York LPGA Convention

At a recent meeting of the planning committee for the New York State L. P. Gas Assn., the Hotel Powers, Rochester, was selected as the site of the annual convention to be held Feb. 24. Gordon Bierbrauer, Churchville, is serving as general chairman, and national LPGA President Mel Trotter has accepted an invitation to be speaker at the closing banquet of the convention.

The committee promises the finest program ever presented at a New York LPGA meeting. Details will be announced soon. Helping Mr. Bierbrauer are committeemen Harry Smith, Wilbur Chapman, Marcy Coyle, Joe Rhode, and Bill Plank.

Southeastern Group to Meet March 22 in Atlanta, Ga.

The LPGA Southeastern district convention will get underway March 22 at the Biltmore hotel, Atlanta, Ga. A record attendance is expected at the three-day convention. The program committee has been working to give the attending L. P. gas dealers some "Take Home Pay" ideas applicable to their own operations.

Because of increased interest in exhibiting, arrangements have been made to allow more time for exhibits in the hall, which inquiries indicate will be filled with the latest appliances and equipment.

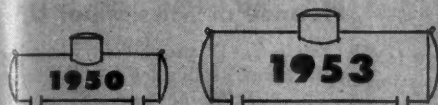
The entertainment committee has big plans and the ladies will not be forgotten as plans progress.

Pennsylvania Group Schedules 1954 Activities

Pennsylvania L. P. Gas Assn. committees have started off the new year with a bang. Most ambitious program for the new year is the educational plan of the educational committee under the chairmanship of Calvin Bathurst, Lock Haven.

To meet the challenge of the state regulatory law now in effect, the committee has planned a program to assist dealers and their personnel, as well as service personnel of the state, to understand the requirements of the new law. The committee has the responsibility of training the inspectors to be employed by the Pennsylvania Department of Labor and Industry for supervision of the law. Additional ideas for promoting the

SALES



DEALER PROFITS



2

Good Reasons Why
You'll Get More Out of
Selling **BS&B**
PROPANE SYSTEMS!

"PERFECTION"



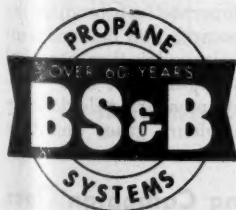
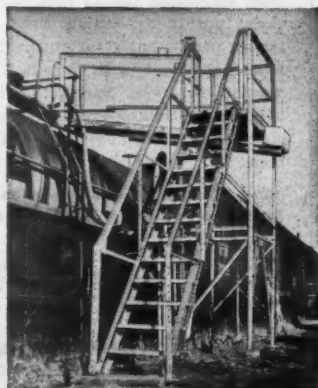
The Most Important Reasons in the world

for handling any product are simply (1) Will customers buy and be satisfied, and (2) Will it sell fast enough to make steady profits?

With Perfection Propane Systems, the answer is a big "Yes!" on both counts. Dealer sales have steadily increased to the point where we've had to *double* our production facilities. You can be sure of satisfied customers since Perfection Systems are made by a company with more than 60 years experience in designing and building pressure vessels! Stock and sell BS&B Propane Systems for city home or farm use, or for small commercial installations.

BS&B Unloading Rack

Here's another BS&B product that's sure to save money for LP Gas dealers — another reason why more dealers are switching to BS&B. Stops awkward unloading, makes walking sure and safe! New BS&B Unloading Rack reduces fire danger to a minimum ... needs only small space. Ladder or stairway located left side, right side or front as you specify. Loading rack folds out of way. Shipped knocked down, cut and marked for easy erection.



BLACK, SIVALLS & BRYSON, INC.

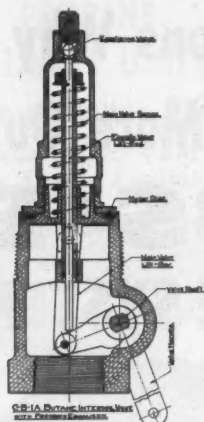
Propane Equipment Division

Dept. 6 AB2

7500 East 12th Street

Kansas City 26, Missouri

POSITIVE CLOSURE FOR ALL L. P. GAS TANKS



Externally operated by remote mechanical control, C-B Valves keep tank outlets closed unless their unique lever action is applied to keep them open.

Valves and fusible links available for storage, bulk delivery and transport tanks, from 2" threaded type to 3" full flange type.

• For complete information write:

C. F. H. BOHNHARDT
C-B EQUIPMENT

1711 East 41st Place - Los Angeles 58

Handy Binder

to preserve your copies
of the new size

BUTANE-PROPANE
News

A Beautiful DeLuxe Binder

These binders are made especially to preserve copies of your favorite magazine. Holds 12 copies—one full year. Magazines can be inserted or taken out in a second's time, or bound permanently for future reference. Covered with long-lasting maroon Du Pont FabriKoid with the name Butane-Propane News stamped in gold on cover and backbone.

Send check for \$2.50 for each binder or \$3.00 from countries outside U. S.

• Add 3% Sales Tax for California orders, and 3½% Sales Tax for Los Angeles City orders.

BUTANE-PROPANE News

198 So. Alvarado St., Los Angeles 57, Calif.

education program are being discussed.

The legislative committee, under the leadership of J. E. Shaffer, Lewistown, was asked to go over the draft of the new regulatory law. The committee presented its findings at a public hearing in December.

Meanwhile the activity committee, under its new chairman, Frank Thompson of Carlisle, is at work on a schedule of district meetings following the theme "A Safety Program and How It Would Affect the Insurance Rate of the Industry." First of the meetings of the new year was Jan. 25 in Greensburg.

R. H. Mahnke Promoted to LPGA Vice Presidency

R. H. Mahnke, manager of district organizations on the national LPGA staff in Chicago, has been made a vice president of the association.

The action was taken at the national board of directors meeting in Charleston, S. C., recently.

A. J. Sleeman Named to Eastern Canadian Post

The LPGA has announced the appointment of Arnold J. Sleeman to serve as secretary for the Eastern Canadian district. His office is at 19 Richmond St., Toronto, and his official title will be secretary-manager.

Mr. Sleeman is a member of the firm of Edward B. Higgins & Associates, who specialize in trade association operations. Previous to joining this company he was employed in the public relations department of the British-American Oil Co., Toronto. He is a graduate of the University of Toronto.

Five Short Courses to Be Offered at North Carolina

Sponsored by the North Carolina L. P. Gas Assn. and several prominent industry leaders, the North Carolina State College of Agriculture & Engineering, Raleigh, is offering five courses in gas technology during 1954. The full time day course of four weeks each are scheduled to begin March 15, April 17, May 24, June 28, and Aug. 2.

The courses cover technical and practical information on the various gases and competitive fuels; maintenance, installation and repair of equipment and appliances; and safety practices and public relations. Emphasis is on shop and laboratory work.

There are no formal entrance requirements and tuition is \$100 for the

four weeks. Room and board are available on the campus. Students are accepted from all states. Complete information may be obtained by writing the College Extension Div., North Carolina State College, Box 5125, Raleigh.

LPG Management Course Planned at Mississippi U.

State L. P. gas industry leaders and representatives of the University of Mississippi met recently on the campus to discuss a short course in L. P. gas management. The course planned will be held at the university July 12-13 in the Continuation Center. Speakers will include LPG experts from throughout the United States. Registration is open to all L. P. gas managers and their staffs.

In attendance at the planning session were Arthur L. Hickman, New Albany, vice president of the Mississippi L. P. Gas Dealers Assn.; Fred Gunter, manager, Attala Butane Co., Kosciusko; George Hammack, manager, Drew (Miss.) Sales Co.; Dewey S. Dearman, Hattiesburg, past president, and Clant M. Seay, executive secretary of the association, Jackson. H. H. Witworth, association president of Oxford, presided. Representing the university were Dr. Karl Morrison of the economics faculty, and D. C. Trexler, director the department of conferences and institutes.

Recommendations Made to Weights & Measures Group

The committee on specifications and tolerances of the 38th National Conference on Weights and Measures has made the following recommendations, according to Walter H. Hoagland, Fisher Governor Co.:

"Liquefied Petroleum Gas: The Committee recommends that the 39th National Conference on Weights & Measures go on record as requesting that the meter manufacturing and petroleum industries, the National Bureau of Standards, and various state departments of weights and measures cooperate in providing the necessary research and development in this field, in order that practical and accurate equipment and methods for testing measuring devices for liquefied petroleum gases might be developed."

Advertising Campaign Goes Into 11th Round This Month

The 11th round of advertising by the LP-Gas Information Service will reach an aggregate readership estimated at more than 116 million when it gets under way this month, and

Ride the 1954 DUO-THERM line to "PROFITS UNLIMITED"!

3 DUO-THERM exclusives make it easier to sell LP-Gas for space heaters

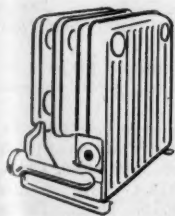
You know and your prospects know that LP-Gas heating is more comfortable, cleaner and more convenient. But cost?

That's where the selling job has to be done and that's where Duo-Therm can help you. These 3 Duo-Therm exclusives knock the cost of LP-Gas space heating down to where more people can afford it:



1. Exclusive Duo-Therm Equaflame Burner

Gets the most heat out of the least gas. Burns a clean, full-bodied blue flame that's uniform size and height at every burner port, on any fire setting low to high. Factory-adjusted for greatest efficiency with LP-Gas.



2. Exclusive Duo-Therm

Extra-Large Heat Chamber and Economizers

Oversize radiating surfaces pick up heat that would otherwise be lost up the chimney and send it into the room instead. The "baffling" action of these built-in radiators means faster transfer of heat, substantial savings in LP-Gas used.



3. Exclusive Duo-Therm

Automatic Power-Air Blower

Saves up to 25% on fuel! Circulates heat *by force*, and operates only when there is heat to circulate. A heat-sensitive switch turns it on and off automatically. This forced circulation results in fuel savings up to \$1 in every \$4.



Beautifully Styled Duo-Therm Windsor Console Home Heater

And in addition to these super economy features the Duo-Therm LP-Gas heater line offers you...

- 10 beautiful, fully vented models to catch every prospect
- The first fully automatic LP-Gas home heaters styled like fine furniture
- Prospects pre-sold by the most powerful national advertising in the industry
- One of the longest profit margins in the entire appliance business

Expand your market for LP-Gas with Duo-Therm heaters. For full details and the name of your distributor, write today.

More than 2½ million warmly satisfied customers . . .

DUO-THERM *Always the Leader!*



Approved by
The American Gas Association

Division of Motor Wheel Corporation • Lansing 3, Michigan

DUO-THERM is a registered trade mark of the Motor Wheel Corp. Copyright, 1954

running on through March, April, and May.

The new series of insertions, which will mark the completion of the first four years of cooperative advertising, will go into 52 national, sectional, and state magazines. Headline theme is "Better Living for Sure . . . With Dependable L. P. Gas."

Major emphasis will be on automatic LPG cooking in domestic consumer ads. Secondary emphasis will be given to the new refrigerators equipped with automatic ice-maker and LPG water heaters in the non-farm magazines, and to L. P. gas as a tractor fuel in the farm periodicals.

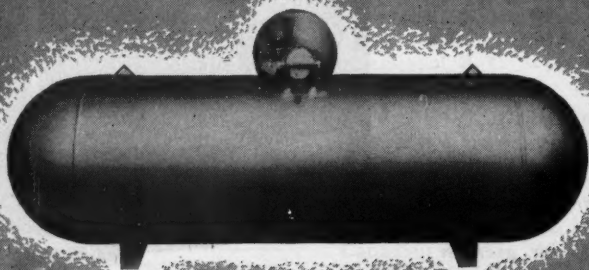
Venting Lectures Sponsored By Illinois Association

The William Wallace Co., Belmont, Calif., under the sponsorship of the Illinois Liquefied Petroleum Gas Assn., is offering a series of illustrated lectures on venting L. P. gas equipment.

The lectures got under way early in January and will be concluded early this month. The February schedule: Fairfield, Feb. 1; Harrisburg, Feb. 2; Murphysboro, Feb. 3; Nashville, Feb. 4; Vandalia, Feb. 5.

George McClellan of the Metalbestos Div. is conducting the lectures.

YOUR MONEY'S WORTH



**FLINT
LPG
TANKS**

FLINT LPG TANKS are sturdily built for longer use yet are light in weight. FLINT TANKS are easy to handle, easy to install. Weather proof heads protect fittings. Built in strict accordance with ASME code for 200/250# working pressure and meet all state requirements. Seven sizes from 120 to 1000 gallons. Also: 6000, 18,000 and 30,000 gallons.

**BUILT RIGHT TO
SELL RIGHT**

SEE THEM AT YOUR BONDED DEALER

FLINT STEEL CORPORATION

MEMPHIS, TENNESSEE

TULSA, OKLAHOMA



CALENDAR

All associations are invited to send in dates of their forthcoming meetings for this calendar.

1954

FEBRUARY

- Feb. 15-16**—Indiana LPGA. Annual convention and trade show. Claypool Hotel, Indianapolis.
- Feb. 21-22**—Iowa LPG Service School, University of Iowa, Ames, Iowa.
- Feb. 24**—New York State L. P. Gas Assn. Annual Convention. Hotel Powers, Rochester, N. Y.
- Feb. 26**—NGAA Permian Basin Regional Meeting, Lincoln Hotel, Odessa, Tex.

MARCH

- March 15**—Southeastern Gas Association Short Course in Gas Technology. North Carolina State College, Raleigh, N. C.
- Mar. 15-17**—Midwest Gas Association. Annual meeting. Fort Des Moines Hotel, Des Moines, Iowa.
- Mar. 22-24**—LPGA Southeastern District. Annual convention. Atlanta-Biltmore Hotel, Atlanta, Ga.

APRIL

- April 5-7**—Nebraska Liquefied Petroleum Gas Dealers Association. Annual convention and trade show. Fontenelle Hotel, Omaha.
- April 9-10**—Western Liquid Gas Association of California. Annual meeting, Palace Hotel, San Francisco.
- April 12-13**—Montana LPGA. Annual convention, Hotel Florence, Missoula.
- April 14-16**—National Petroleum Association. Semi-annual meeting. Cleveland Hotel, Cleveland, Ohio.
- April 21-23**—NGAA 33rd Annual Convention, Baker Hotel, Dallas, Tex.
- April 24**—Western Liquid Gas Association. Annual meeting, Palace Hotel, San Francisco, Calif.
- April 25-27**—Mississippi LPGA. Annual Convention. Edgewater Gulf Hotel, Edgewater Park.
- April 26-28**—Midwest Regional Gas Sales Conference. Edgewater Beach Hotel, Chicago, Ill.

MAY

- May 9-12**—LPGA annual convention and trade show. Conrad Hilton Hotel, Chicago.
- May 19-21**—Gas Appliance Manufacturers Association. Annual meeting. Drake Hotel, Chicago.
- May 24-25**—Utah LPGA. Annual convention, Hotel Newhouse, Salt Lake City.

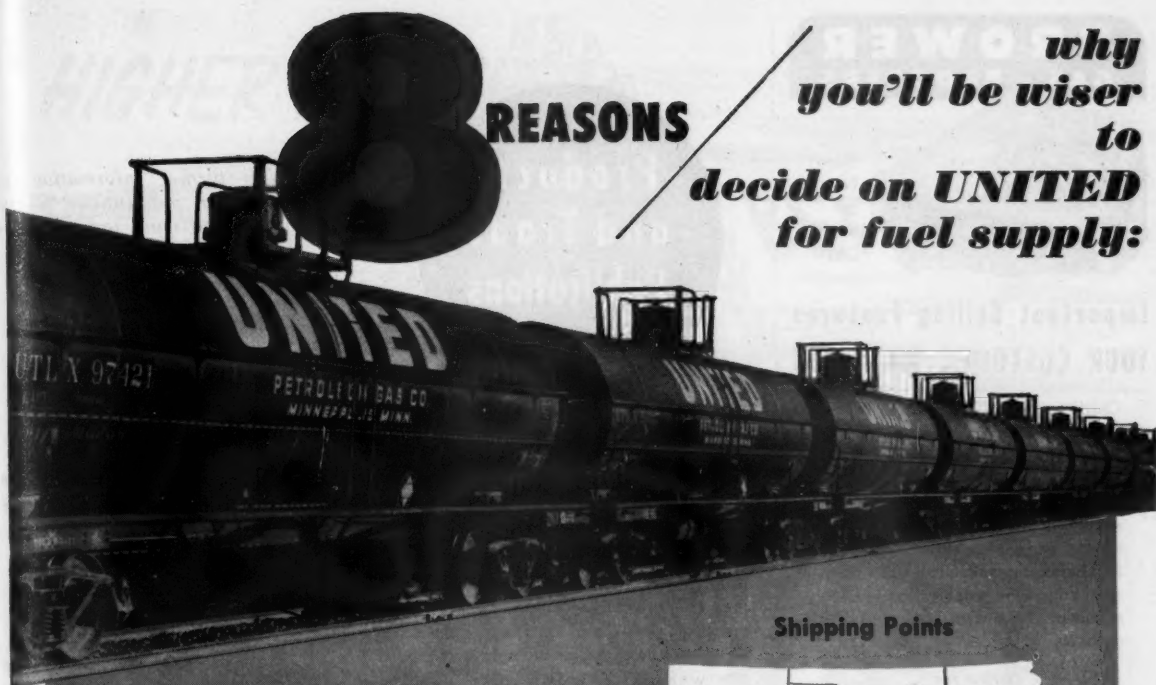
JUNE

- June 6-8**—Arkansas Butane Dealers Assn. Annual Convention.
- June 28-29**—Wyoming L. P. Gas Assn. Meeting. Townsend Hotel, Casper.

BUTANE-PROPANE News

8 REASONS

*why
you'll be wiser
to
decide on UNITED
for fuel supply:*



Shipping Points



- 1** We operate our own large fleet of tank cars. Controlling the means of shipment, we can and do deliver as per contract.
- 2** We ship from more than 12 producing points representing 11 gas-producing sources in four states. Our multiple-sources-of-supply assures you that we'll have enough product to meet our contract with you, even though strikes, storms or other unpredictable events may temporarily close down one or more of our many supplier companies or plants.
- 3** Competitive freight rates to all areas east of the Rockies, due to widespread location of producing points.
- 4** Inventory control for customers who desire it—a "keep fill" service that keeps you automatically well-supplied with fuel.
- 5** Quality control to assure you of best-available L-P Gas, always. Since we choose for you from the best product available, nationwide, we can and do supply top quality material.
- 6** Guaranteed supply and delivery as per contract. Few if any can match our record: check it if you're from Missouri. United has consistently maintained delivery promises (per contract) in spite of fire, flood, hurricane and shut-down—problems that would worry any operator holding a contract with a one-source supplier. But not a United customer!
- 7** Experienced technical advice and service—a fact that has saved many United customers a lot of money and concern.
- 8** Prompt and fair claim adjustment.

Your fuel contract is your most important single yearly purchase. So the question of fuel supply deserves your serious thought. We invite you to compare, and to weigh the advantages of a United fuel contract against others that are

offered you. There is a very real value in the "built-in safety factors" that protect the signer of a United contract. Our multiple sources of supply plus control of a large tank car fleet has given us a proved record of ability to deliver.

IT PAYS 10 WAYS TO DO BUSINESS WITH UNITED

UNITED PETROLEUM GAS COMPANY

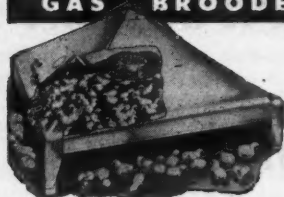
806 ANDRUS BLDG. • MINNEAPOLIS, MINNESOTA

S. E. NAVICKAS
No. 1 West St. Albans Rd. Minneapolis 16, Minn.
ROBERT J. BELL
211 N. 3rd St., Apt. 5 LaCrosse, Wisconsin
W. A. STANGE
231 Linden Drive Centerville, Ohio

Sales Representatives:
J. P. LYONS
1011 Electric Bldg. Houston, Texas
D. A. LARSON
330 Couch Ave. Kirtwood, Mo.

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Box 788 Clinton, Mississippi

BROWER GAS BROODERS



Burn
Natural
or
Butane
Gas

Important Selling Features YOUR CUSTOMER WILL WANT

Chicks are **SAFE** — Robertshaw 100% Shut-Off Valve turns off gas if pilot goes out. 1" fiberglass insulation between deflector plate and hover top conserves and directs heat against baffle plate. Radiator, deflector and baffle plate spread heat evenly. Thermostat controlled. Draft-proof ventilation. Adjustable legs. Thermometer. Two sizes—60" and 72" canopies.

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BROWER MFG. CO.

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Quincy, Illinois

World's Largest Line of Poultry Supplies

Mallinckrodt
**ETHYL
MERCAPTAN**
purified

it says **LOOK OUT**



- The accepted standard odorant for natural or liquefied petroleum gas — gives sure but harmless warning.
- Purified — Moisture-free — **PROTECTS FIXTURES.** Meets all 15 qualifications of National Bureau of Standards.

Mallinckrodt®

MALLINCKRODT CHEMICAL WORKS
Mallinckrodt St., St. Louis 7, Mo.
72 Gold St., New York 8, New York

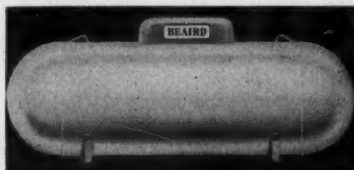
Products and Trade Publications

To secure further information on products or new publications, fill out the coupon and mail, indicating by number the items desired.

1. New LPG Systems

Two new L. P. gas systems are now in production by The J. B. Beard Co. Inc. One is being manufactured in the firm's Stockton, Calif. factory, and the other in its Shreveport, La. plant. A feature of both systems is a new seamless dome with low silhouette which gives a distinctive look.

The Shreveport system has a round dome to protect its multi-valve fitting and regulator. The Stockton system's dome is elongated to fit the row of individual fittings with which it is equipped. Both domes are equipped with a concealed hinge of new design.

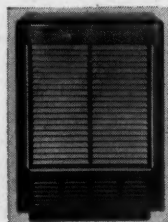


Heavy dome latches have a convenient lifting lip which permits domes to be opened and closed easily without danger of pinching fingers, and a spring locking pin is also included. As an added safety precaution, lifting

lugs, formed from heavy steel, have been carefully designed to reduce stresses in lifting and handling.

The J. B. Beard Co.

2. Air Conditioner



The new "Five Thousand," a console type winter air conditioner, manufactured by the Ohio Foundry & Manufacturing Co., highlights the Brilliant Fire line for '54. The

new model heats, circulates, filters and humidifies; is engineered for all gases and for high altitude operation, and is AGA approved.

Completely automatic, it is equipped with Robertshaw Nitrol and precision-ignition safety pilot. An especially designed draft diverter which is built in provides protection against both down and up drafts.

The Five Thousand has cool-body construction, and introduces a Fiber-



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Just fill in this coupon for Products information and copies of new publications, and mail to

BUTANE-PROPANE NEWS, 198 S. Alvarado St., Los Angeles 57, Calif.

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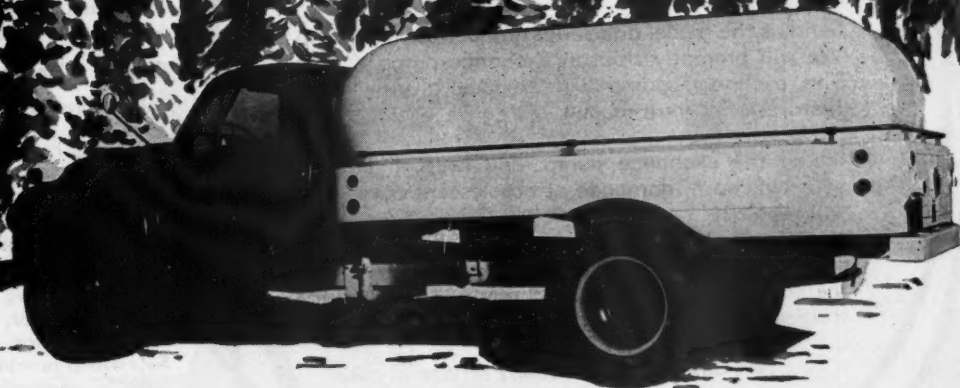
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HIGHER PROFITS THAN EVER BEFORE...

are now possible with LMC's new home delivery trucks!



The LMC incorporates all the desirable features of home delivery units in one model:

ECONOMY • HIGH PAYLOAD • SAFETY • SMART APPEARANCE



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DRAWER 1589

PHONE 3-4631

LUBBOCK, TEXAS

glas-insulated cabinet. The heating section is gas-tight from burner to flue and is 100% welded throughout.

It is rated at 50,000 Btu input and is finished in opalescent beige with ivory grill (infra-red baked enamel) with gold-bronze trim.

The Ohio Foundry & Mfg. Co.

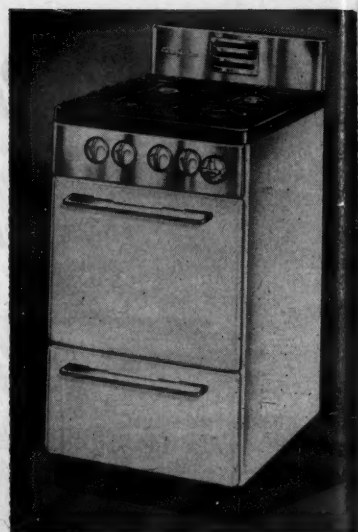
3. Gas Range

Sparkling and new is the Model M-610 Perfection gas range, a 19½-inch model with its top surface finished in black porcelain enamel.

The oven, with its automatic lighter, is full family-size. A tiny pilot light provides automatic ignition for both oven and broiler. Both the oven and smokeless broiler are finished in Perfection speckled-blue porcelain enamel.

The single giant and three standard Lincoln non-clog burners are widely spaced to accommodate large cooking utensils. The cast iron grates and the burner trays are finished in black porcelain enamel.

The Model M-610 Perfection gas range is ideal to use where space is limited or where the homemaker de-



sires to use two apartment-size ranges in combination with two or more utility cabinets or tables.

Because it has been designed with universal orifices and burners, the Model M-610 may be used with natural, manufactured or L. P. gas.

Perfection Stove Co.

4. Gas Disposer

Caloric Stove Corp. has introduced the Caloric double duty automatic gas disposer, featuring the Calor-a-Tred, a foot pedal for opening the loading door, and the Calor-a-Set, which provides the householder with a convenient adjustment to meet any disposal need. The disposer may be installed in kitchen or basement, so long as its 6-in. flue is connected to a chimney.



Other features of the disposer are the practical loading opening which makes for easier disposal of bundles of trash or garbage; heavy-gauge steel construction of the dehydration chamber; main top and loading door of acid-resisting porcelain, and durable Nupon finish on the cabinet. The unit is glass lined.

The disposer stands 36¼ in. high on its four legs, and occupies a space only 18 in. wide by 24 in. deep. Because of scientific design and construction, safe smokeless and odorless operation is assured. Economy is designed into the unit with its maximum gas input of 3000 Btu per hour.

Caloric Stove Corp.

Do you know about

The CORKEN EXCHANGE PLAN?

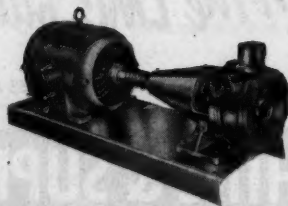
If you have a Corken Compressor or Pump that's anything less than the Corken Good Ones we make today, you can do this:

Send us the model and serial number of your pump. We will promptly ship an exchange pump, C.O.D. The exchange pump will embody all the latest features of current models.

Install the exchange pump, and **keep** it. Ship us your old, worn, damaged or obsolescent pump. We will repair it.

Then we will return your full deposit to you, less the cost of repairing your old pump. That, and the transportation charges are all you pay.

This amounts to a standby service in case of emergency, as well as a plan for keeping Corken pumps up-to-date.



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"SALES CLINCHERS" FOR GAS RANGE SALESMEN

No. 5 of a series

To sell her the *GAS* range, show
her *COOL COOKING* with...

ALLTROL® *Center Simmer**

You're offering her *more comfort*... cooking in a kitchen
up to 9° cooler. A big selling point any time is no wasted
heat. *Show* her why! The small Center Simmer keeps
food at top cooking speed with a flame that heats the pan,
not the air around it!

ONLY ALLTROL BURNERS HAVE A COMPLETE HEAT CYCLE



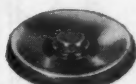
Full flame Starting
Burner for quick boil or
fast frying.



A full range of inter-
mediate heats when wide
spread of heat is needed.



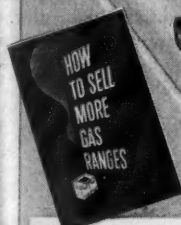
Click... here's efficient "Center
Simmer" that maintains
boiling in any covered vessel.



Click... a gentle "Keep
Warm" heat... without
further cooking.

*Write for names of ranges featuring ALLTROL Center Simmer.

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SEND FOR FREE BOOKLET,
"How to Sell More
Gas Ranges"
Address Dept. 24B

HARPER-WYMAN COMPANY

8562 Vincennes Avenue

Chicago 20, Illinois

"ALLTROL CENTER SIMMER" MAKES GAS THE WINNER!



5. LPG Valves



seal, for leakproof operation, and swivel construction of the seat

The Bastian-Blessing Co. has embodied in the design of the new RegO No. 2505V to 2514V series globe and angle valves such features as RegO V-ring teflon pressure

disc assembly, for positive shut-off. The series is particularly suited for service in industrial installations, bulk storage plants, cylinder filling plants, transports and truck tanks.

Positive alignment and perfect contact between seat disc and valve seat, provided by the swivel construction, prevents the seating surface from wearing away and at the same time assures positive shut-off. The valve can be back-seated in full-open position, if desired.

Spacious port size and adequate valve lift provide flow channel great-

er in area than that of connected pipe size, resulting in minimum friction loss.

Valve bodies are of heavy cast bronze, bonnets are forged brass and bonnet bolts are stainless steel. Heavy-duty, quick-acting Acme threads and large cadmium-plated steel handwheels assure easy operation.

Bastian-Blessing Co.

6. Gas Range

A gas range with radiant gas rotisserie has just been introduced by Welbilt Stove Co.

Welbilt has adapted the unusual broiler device to this new model, so that every type of kitchen facility and preference can be satisfied. An additional innovation is the Sizzle Griddle on top of the stove. Thus, all cooking facilities are combined in a single unit.



The deluxe features of high-speed cooking, top of stove control center through a four hour timer, clock, lamp outlet, Kleer-View glass windows on both rotisserie broiler and oven, gleaming top burner bowls and white porcelain finish are available in all three models.

Welbilt Stove Co.

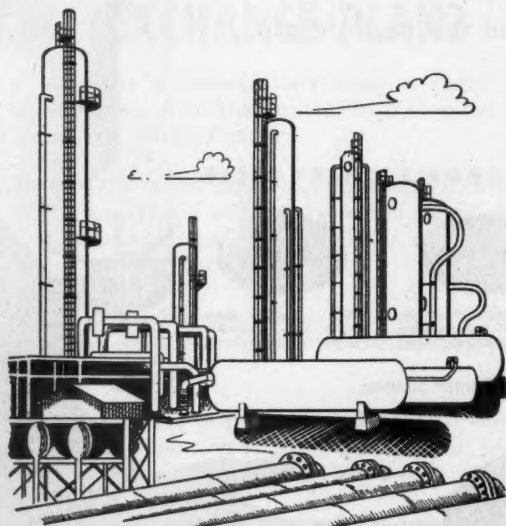
7. Clothes Dryer

The Norge Div., Borg-Warner Corp. now has available a new low cost automatic clothes dryer which has rigid thermostatic controls eliminating danger of burning and scorching laundry. Drying temperature is held to a 140° maximum. Nine pounds of dry clothes or 18 lbs. of damp clothes can be gently tumble-dried in the 29-in. cylinder, Epon-finished to prevent linting and excess wear.

Time-Line control panel registers all cycles of the flexible two-hour

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LIQUEFIED PETROLEUM GAS



... in L. P. gas also Cities Service means Good Service

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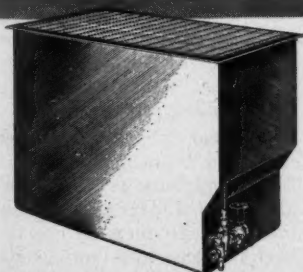


EXPAND SALES in Two Directions with TEMCO LP AUTOMATIC GAS HEAT!

DIRECTION ONE — You can take care of houses without basements with the Temco Automatic Gas Floor Furnace. Shallow construction (just 25½" Overall) means easier, less expensive installation. Specifically engineered for use with LP gas, each Temco floor furnace contains

Temco's famous porcelain enamel heat chamber that carries a written 20 year warranty.

DIRECTION TWO — You can take care of those two-story houses, or houses with slab foundations by installing Temco Automatic Gas Wall Heaters. Available in single and dual wall models, these LP gas wall heaters require no floor space . . . fit between standard O. C. Studding. For the full story, return the coupon today!



TEMCO AUTOMATIC GAS FLOOR FURNACE
Needs no basement . . . fits right into the floor . . . 20 year warranty on heat chamber . . . shallow construction.



TEMCO, inc.

NASHVILLE, TENN.

BUILDER OF OVER 1,500,000 GAS APPLIANCES



TEMCO, Inc., Dept. B-669, Nashville 9, Tenn.

Please send catalogue and full information on the profit possibilities of TEMCO Automatic Gas Heaters.

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Key to EFFICIENCY

BARBER
slotted-cap JET

Barber Burners equipped with the famous Barber "slotted-cap" jets are available in round, oblong, and square shapes with inputs of 7000 to 198000 B. T. U.

WRITE FOR CATALOG No. 110
the
Barber Gas Burner
3682 Superior Ave. CO.
Cleveland 14, Ohio



BURNHAM
LPG
TANKS

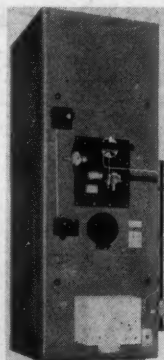
17 standard systems from 250 to 1,000 gallons — center and end-mount styles. The quality, safety, and service built into these tanks are second to none. Shipped moisture-free. Registered with National Board.

Burnham
TANK DIVISION • IRVINGTON, NEW YORK

drying period. Other features are convenient knee latch release, 180° opening door, five-way venting, and automatic shutoff.

Borg-Warner Corp.

8. Warm Air Heater



The Sunbeam Air Conditioner Div. of American Radiator and Standard Sanitary Corp. has announced the availability of four new Sunbeam warm air heating products — two counterflow and two utility type units.

These new winter air conditioners will be known as the Winterline and the Winterglo; they are designed for installation in small to medium size modern homes, either with or without basements, and each model will be available for either gas or oil firing. Specially designed burners permit easy conversion from one fuel to the other at any time with no loss in capacity. The new units are all made in three sizes — 76,000, 90,000 and 100,000 Btu per hour at bonnet.

The Winterglo models are utility units and use conventional duct systems. The Winterline models, operating on the counterflow principle, require a minimum of duct work in homes with perimeter heating systems.

American Radiator &
Standard Sanitary Corp.

9. Portable Heater

A redesigned Standard Model Herman Nelson portable air heater has been announced recently. The improved model is described as being powered with a new Briggs and Stratton Model 6 Engine. It is claimed that the use of this streamlined, more powerful engine has permitted modification in engine mounting resulting in a much simpler, cleaner arrangement of components at the air intake end of the heater.

A new addition is a fuel metering valve which can reduce the capacity of the unit from its maximum 385,000 Btu's to a low of 100,000 Btu's per hour. This permits considerable saving in fuel consumption at the lower, frequently desired capacities.

The Standard model is the only

self-contained gasoline fired unit in the Herman Nelson line. It is ideally suited where electricity is not available and where easy portable and spot heating in the ducts are important factors.

American Air Filter Co.

10. Gas Range

The Utility Appliance Corp. has introduced a new and exclusive cooking feature on its two lines of gas ranges, Gaffers & Sattler and Occidental.

Its feature—a top burner timer—enables the housewife to cook automatically on top of the range, simply by dialing the length of cooking time required for the particular dish.

Perfect for timing eggs, coffee, or pressure cooking, T.B.T. (top burner timer) operates by a simple 1-2-3 procedure. The homemaker presses in



the center button of the timer, turns on burner and adjusts the flame to the desired heat, and dials the required cooking time, and when that time is completed, the burner shuts off automatically.

Utility Appliance Corp.

11. Safety Lamp

A new explosion-proof, rain-tight hand lamp weighing only 4¾ pounds —almost half the weight and about half the size of previous lamps of its type—has just been introduced by Crouse-Hinds Co.

Only the globe guard, globe-holder, and cord connector housing of the lightweight lamp (type EVH 103) are aluminum. The lamp receptacle housing, aluminum on earlier models, has been replaced by a light-weight high-impact molded phenolic composition. Phenolic bone fibre, another strong lightweight material, forms the lamp handle.

The new lamp also has much higher impact-resisting qualities. Its

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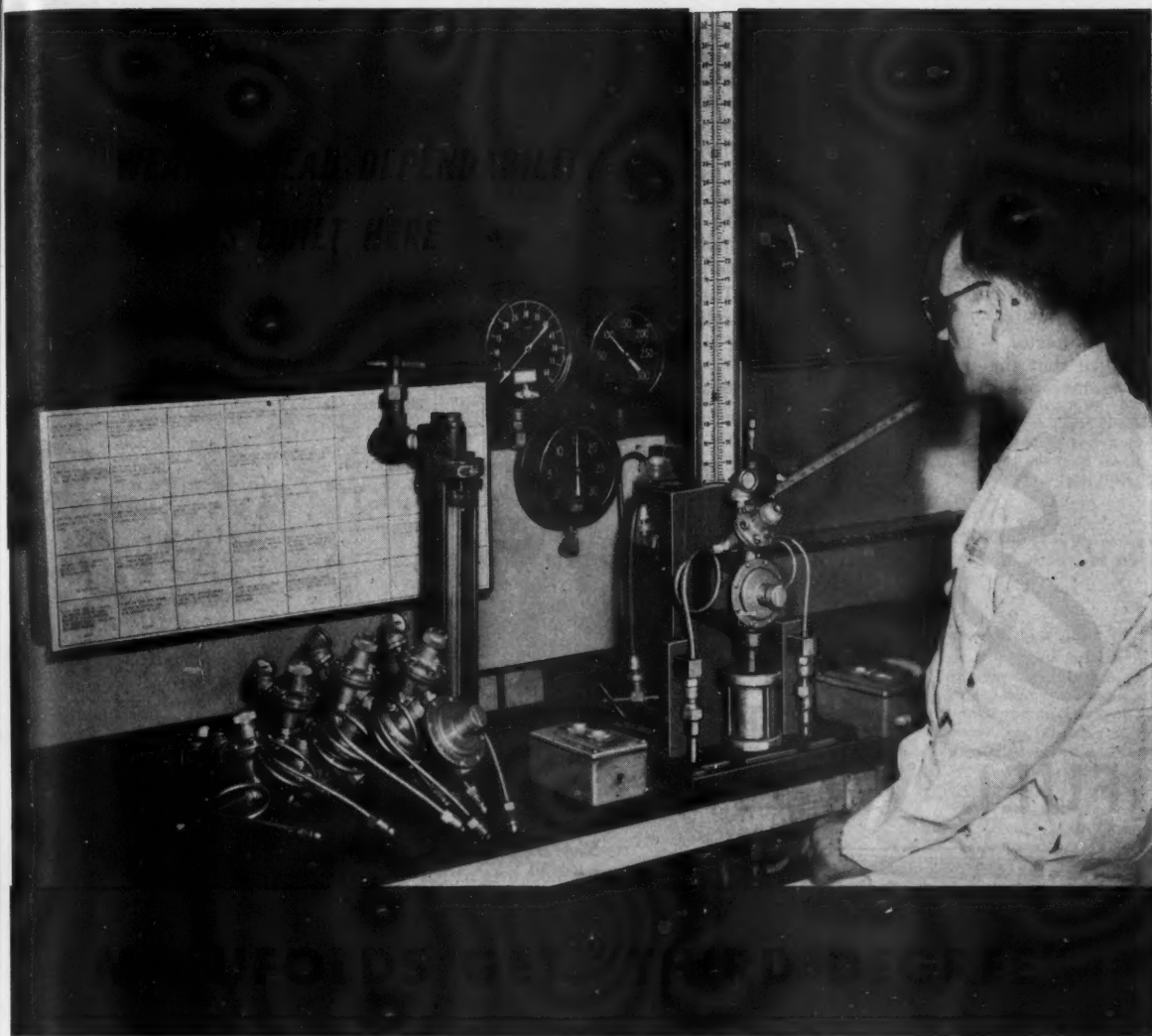
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Weatherhead dependability begins on the drawing boards in our design and engineering department. It grows with painstaking analysis and selection of materials. It is finally proved by exhaustive testing of finished products.

Weatherhead manifolds are one example. Skilled technicians, using the most modern equipment, first give each regulator from 13 to 22 separate checks, depending on the type. Then, in a second test duplicating the most severe conditions of field service, they make a minimum of 16 additional checks on every complete manifold assembly.

Tee-Check, Manual or Automatic, you can be certain of dependability with Weatherhead Manifolds and every other item of LP-Gas Equipment we manufacture.

Order from The Weatherhead Company, Dept. G-1, 300 East 131st Street, Cleveland 8, O., or from Weatherhead warehouses in Albany, N. Y.; Atlanta, Ga.; Dallas, Texas; Memphis, Tennessee.



The Mark of Quality

WEATHERHEAD

ENGINEERING ABILITY

MEANS PRODUCT DEPENDABILITY!



globe is seated firmly against a metal flange by a heat and impact-resistant globe guard. Drop tests by Underwriters Laboratories and Crouse-Hinds technicians have demonstrated that the globe cannot loosen, even under severe shock. Explosion tests and twist tests—straining cord and cord connector—were necessary to be sure that the new lamp met or surpassed the National Electrical

Code's four-to-one safety factor.

Both lamp chamber and handle are explosion-proof, separated by the lamp receptacle. Rubber bushings are supplied with the fixture to accommodate $\frac{3}{8}$ -inch to $\frac{5}{8}$ -inch portable cord. Besides forming a watertight seal, these bushings, together with a mechanical cable clamp, by gripping the cable tightly, relieve strain on cord connector assembly.

The fixture is illuminated by a standard 100-watt (A-21) rough service lamp.

Crouse-Hinds Co.

Introducing a New *Enterprise* Selling Feature... FULL WIDTH OVEN



Show any prospect the full width oven on this 30" deluxe model... the automatic lighting and timing... modern tank-type design that collects no grease. Lift out the easy-to-remove bottom. Show the Smokeless Drawer Broiler that rolls out freely on ball bearings.

Point out the many other features... especially the all porcelain rust-proof chassis and the price tag that's up to \$75 less than any comparable range.



Serving a value-conscious America for nearly 100 Years.

PHILLIPS & BUTTORFF MANUFACTURING COMPANY
NASHVILLE, TENNESSEE

12. Gas Range

Honoring the company's 75th anniversary, Hardwick Stove Co., is now showing a new Hardwick 75 series gas range. Several new models are included in this series.

The outstanding feature is 100% safety shutoff for all top burners as well as the oven, resulting from a new and improved Super Economatic ignition system.

Their engineers have been able to simplify the ignition assembly to



such an extent that it can now be included on top burners because it actually requires no more space than the conventional pilot tube. By eliminating the usual bulky parts needed for 100% shutoff, they have applied this outstanding safety feature to all top burners on all ranges and to the top burner and oven of Hardwick apartment models, and are offering for the first time Hardwick apartment models with automatic lighting for the oven.

Hardwick Stove Co.

Product Information

13. New Booklet Offered

Ansul Chemical Co. has issued Technical Bulletin No. 33 (reprinted from The Bulletin Department of Agriculture, State of California). It discusses the "Effect of Dry Chemical Extinguishing Materials on the Viability of Seeds."

Ansul Chemical Co.

14. Display Material

To help you sell more Super-Sheen chrome pipe, St. Clair Metal Products Co. is offering an attractive, colorful counter or window display free—complete with one length of 4 x 12 Super-Sheen chrome pipe.

St. Clair Metal Products Co.

Get the **FACTS** and You'll *Buy Trinity*

Finest chrome hardware... large double-door rear compartment.

Two large stoplights... ICC and directionals. Two recessed license plate holders.

Hose troughs in factory-tailored lightweight streamlined skirting... large enough to accommodate boss fittings and valves.

Two coats DuPont Automotive enamel over red oxide... a beautiful glossy hard finish.

Relief valves recessed for safety, with long radius pipe bend to accommodate full flow characteristics.

Recessed rotary gauge, thermometer and pressure gauge... in longitudinal center for accurate calibration.

Finest kingpin obtainable welded to rugged one-half inch steel rub plate. Homan vertical landing gear is bar padded to eliminate concentrated load on tank shell.

All stress points bar padded including basket type spare tire carrier.

Rayco tandem unit... specially designed for tank industry with equalizer, rubber bushed radius rods and road-proved springs, providing immediate, sensitive shock transfer between finest Timken 5" diameter tubular 18,000 lb. axles.

The industry's safest air brakes with easy-to-reach slack adjusters. Wide base rims for maximum safety and tire mileage. Nail deflectors between tandem tires.

Color-coded electrical wiring including 6 or 4-way trailer connections.

1 1/4" vapor and 2" liquid manifolding with finest available valves and fittings.

Perfectly spaced baffles with as many as 15 tie-downs each.

10:00x20 12-ply tires, tubes and flaps on weight saving spoke-type wheels.

CHALLENGER MODEL —
Newest of Trinity Steel's
world-famous Transports

Every One of these features is **STANDARD** with **TRINITY**



Write, Wire or Phone for detailed information on the Challenger Unit, Trinity's Truck-Tanks, and the famous Eveready Gas System.

5600 WG Twin Challenger Unit pictured, 250 lb. WP, ready to hook to your tractor — Excise Tax Paid...

\$6975⁰⁰

F.O.B. DALLAS, TEXAS

Engineered and
Designed by...

Other sizes available to meet your existing
State Regulations.



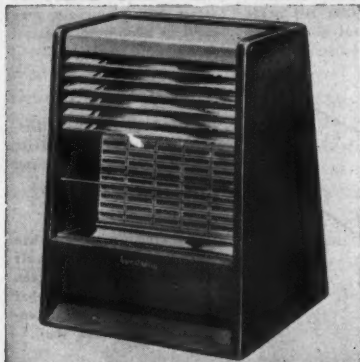
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FEBRUARY, 1954

101

ARMSTRONG

Presents Their New
COOL CONSOLE



A brand new radiant heater for any gas—with top and sides cool enough to touch without getting burned.

This safety feature, added to Armstrong high quality workmanship and beauty of design, makes it one of the finest unvented circulators ever developed. Body is finished in an attractive new shade called "Mocha-Tone". 26" high, 14" deep. 16½" wide for 24,000 B.T.U., 19" wide for 30,000 B.T.U. AGA approved.

ORDER FROM YOUR JOBBER
or write for literature on the
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Quality Since 1899
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We are signing franchises with bottle gas dealers all over "hard water" America.



You have the set-up and the customers. Deliver rental softener units to homes, laundries, beauty parlors, cleaning plants . . . wherever soft water is needed.

Get a



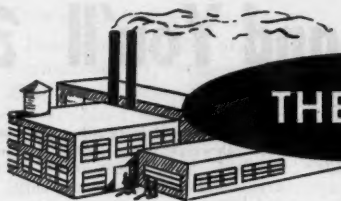
Franchise

All you need are the softener units and the inexpensive regeneration equipment. Franchise includes the sale of DOWEX to all domestic, commercial and industrial areas.

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Corporation**

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THE TRADE



The Bastian-Blessing Co.



Sam E. McTier

Sam E. McTier has returned to the Bastian-Blessing Co., Chicago, and will assume duties as assistant district sales manager of the Rego Div. after two years service as a Navy lieutenant (j.g.)

in Japan and Korea.

Formerly sales engineer for the company, before his recall to active duty in February 1952, Mr. McTier will sell Rego L. P. gas and anhydrous ammonia equipment under H. A. Goodwin, district sales manager.

president of Rockwell's power tool division was accepted recently by F. P. Maxwell, who resigned as president of Acro Manufacturing Co., Columbus, Ohio.

Joseph Pommersheim, a project engineer at Rockwell's Homewood plant, has been promoted to chief engineer of the company's Norwalk, Ohio, plant.

H. O. Proske, service manager for the company's meter and valve division, has been named national representative specializing in gas meter sales promotion.

Detroit-Michigan Stove Co.

John M. Storm was recently appointed sales manager and Milton W. Elert was made advertising and sales promotion manager of the Detroit-Michigan Stove Co.

Rockwell Manufacturing Co.

With the opening of a new 19,000-sq. ft. addition to its gas meter plant in DuBois, Pa., the Rockwell Manufacturing Co. has transferred production of large-capacity gas meters from Pittsburgh to the DuBois plant.

At their Norwalk, Ohio, plant, Rockwell is also building a 25,000-sq.-ft. addition to house the production of its smaller balanced valve gas



J. M. Storm



M. W. Elert

Mr. Elert succeeds E. C. Barrows, who will assist him in his new expanded department, while Mr. Storm replaces Mr. Elert as sales manager. Mr. Storm was formerly Southwestern division manager of Detroit-Michigan, while Mr. Elert has been with the company since 1937 and was appointed sales manager in 1950.



F. P. Maxwell



H. O. Proske

regulators. This addition is being erected chiefly for the purpose of coordinating Rockwell gas regulator production at one location.

Dr. Charles J. Kentler Jr., formerly manager of refinery and chemical sales, Rockwell, has been named technical consultant for the entire meter and valve division.

The newly created position of vice

The American Car and Foundry Co.

The American Car and Foundry Co. recently promoted Richard P. Connette to the post of assistant vice president.

James F. Clark, the company's vice president in charge of finance, was elected a member of the board of directors at its December meeting.

Buried treasure ...for you!

**How Pure Oil has stored away
millions of gallons of LPG to
meet your demands.**

You probably know already that Pure Oil operates one of the largest natural gasoline plants in America in the Dollarhide field of West Texas.

Two thousand feet underground near that plant hydraulic engineers have washed out two huge storage caverns.

These caverns are now filled with millions of gallons of commercial propane meeting NGAA specifications.

This winter, this supply is available to help us make prompt, dependable shipments.

This "buried treasure" is available to you. Write or call any of The Pure Oil Company offices at the right.



Puregas

**Be sure
with Pure**



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Tampa, Florida, Box 1630 • Houston, Texas, Box 239
Tulsa, Okla., Box 271 • Worland, Wyoming, Box 38
Minneapolis, Minnesota, 1306 South First Street

American Radiator and Standard Sanitary Corp.

A new division of American Radiator and Standard Sanitary Corp. has been created, it was announced recently by Joseph A. Grazier, president. Called the Amstan supply division, the new organization takes over all operations of the corporation's former branch house department.

Headquarters of the new division are Pittsburgh, Pa., and branches are located in 22 states in the Midwest, Southwest and Pacific coast areas, to

serve plumbing and heating retailers and industrial customers.

Amstan branches supply materials required for plumbing, heating and air conditioning installations as well as appliances and a wide variety of industrial supplies.

Top executives of the new division are Robert F. Sells, president, and Joseph Salamone, executive vice president.

William H. Baker, Jr., has been appointed vice president of the Sunbeam Air Conditioner Div. of American Standard.

A. O. Smith Corp.

The promotion of Walter W. Stake to the position of regional manager for the eastern district of the Perna-glas-Heating Div. of A. O. Smith



W. W. Stake



A. O. Dragge

Corp., Milwaukee, was announced recently. He succeeds the late Russell J. Irish, who headed the New York office.

Allen O. Dragge, who had jurisdiction over the West coast operations, is now regional manager of Pacific coast district, Los Angeles.

Formerly manager of the automotive division of the company, Charles E. Heitman has been named to fill the post of assistant to the general manager.

Chattanooga Implement and Manufacturing Co.

The Chattanooga (Tenn.) Implement and Manufacturing Co. has changed its name to Chattanooga Royal Co., and promoted R. H. Mason



C. W. Jacoby



H. B. Weatherly

to assistant general sales manager; while Ben F. Foxworth was made manager of barbecue grill sales; C. Wesley Jacoby, manager of space heater sales; and Harley B. Weatherly, manager of wall heater sales.

Cities Service Oil Co.

S. D. McMurtry, manager of Cities Service Oil Co.'s Ponca City (Okla.) refinery, has been transferred to the Bartlesville headquarters office on special assignment.

D. R. McConnohie of Bartlesville, assistant to the general superintendent of refining, will assume Mr. McMurtry's duties at Ponca City.

PENNSYLVANIA LP DEALER TELLS WHY HE SELLS CALORIC GAS RANGES



David O. Yorgey
Yorgey's Appliances
5th Street Highway
Reading, Penna.

**"Caloric range values are the best
and I make more in 54!"**

Buying direct is one of the many advantages you find when you sell Caloric gas appliances. Here are some others.

One Pricing Policy... always the same for every dealer—the best deal for you every time you buy.

Unmatched Advertising... for 8 straight years, the heaviest concentration of sustained advertising in the entire gas range industry.

Dynamic Merchandising Program... promotional helps and a point of sale program make the most of Caloric features.

52 Warehouses... located throughout the country, these warehouses assure faster delivery, speedier service. Minimum inventory for maximum sales.

Dione Lucas... Gas cooking TV show... half-hour shows in more than 40 markets—a national TV star selling Caloric for you.

The new Caloric floor plan... Makes it easier to display and sell the full line. **Caloric value**... Caloric gas appliances are built to give your customers full value and trouble free service. This means more profit for you!

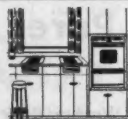
MAKE SURE YOU SELL CALORIC GAS APPLIANCES • FOR COMPLETE INFORMATION, CHECK YOUR CALORIC REPRESENTATIVE

Caloric

CALORIC STOVE CORPORATION, TOPTON, PA.



RANGES



BUILT-IN RANGE UNITS



DRYERS



DISPOSERS

Bowser, Inc.

Clifford E. Hall has been appointed sales manager for the Incineration Div., Bowser, Inc., it was announced by J. G. Dierkes, president.

Formerly promotion manager of



Clifford Hall

the American Gas Association since 1946, Mr. Hall will direct an expanding sales and promotion program for the Incinor line of automatic gas-fired incinerators manufactured by Bowser, Inc.

Rheem Manufacturing Co.

William S. Goodfellow has been named Eastern division manager of the Rheem Manufacturing Co.'s Chicago headquarters. He will now as-



W. S. Goodfellow



J. P. Makenas

sume responsibility for all of the company's manufacturing and marketing activities east of the Rockies.

Replacing Mr. Goodfellow as central region manager is Joseph P. Makenas. He will be in charge of marketing and manufacturing activities in the company's Chicago and Midwest area.

Empire Stove Co.

Tom S. Tomer has been appointed district manager for the eastern Nebraska and western Iowa territories of Empire Stove Co., Belleville, Ill. He will headquarter at Falls City, Neb.

Peerless Manufacturing Corp.

The Peerless Manufacturing Corp. has appointed Marvin Stark director of engineering. He will have full charge of all engineering and development activities.

Norwalk Valve Co.

Norwalk Valve Co. has opened a new assembly section in its main plant in South Norwalk, Conn.

The new section will be used for the complete assembly and testing of all the smaller regulators and check valves which the company manufactures.

Eureka Williams Corp.

Eureka Williams Corp., Bloomington, Ill., has sold its manufacturing assets to the Henney Motor Co., Free-

port. The Bloomington firm manufactures gas home heating units, while the Freeport company makes specialized automotive bodies.

Hamilton Manufacturing Co.

D. C. McDermid has rejoined the sales staff of the Home Appliance Div. of the Hamilton Manufacturing Co., Two Rivers, Wis. He was released from active duty with the United States Navy in November, and has tentatively been assigned to an Eastern territory.

KENTUCKY LP DEALER TELLS WHY HE SELLS CALORIC GAS DRYERS



W. H. Crawford

W. H. Crawford
Farmer's Supply Company
Lexington, Kentucky



"Only Caloric offers my customers
the Exclusive Sifto-Bag lint trap"

The new nylon "Sifto-Bag" is one more example of the value features in Caloric appliances. This lint trap is located in the front of the dryer where it's easy to use. As the most efficient lint trap in existence, it's a dramatically important improvement in dryers. Of course, it's exclusive with Caloric. Here are some other Caloric features.

Caloric's Lo-Heat Hi-Breeze principle combines safe, low temperatures and

high volume air-flow to just the right degree for fluffier, wrinkle-free clothes.

All working parts are easily accessible. Controls easily reached by removing top housing or front panel. Servicing is done from top and front.

One-knob control lights the burner and starts dryer. Completely automatic operation.

Waist-high air intake. Sturdy drop door for easy loading and unloading. Choice of three-way moisture exhaust.

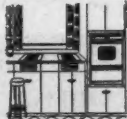
MAKE SURE YOU SELL CALORIC GAS APPLIANCES
FOR COMPLETE INFORMATION, CHECK YOUR CALORIC REPRESENTATIVE

Caloric

CALORIC STOVE CORPORATION, TOPTON, PA.



RANGES



BUILT-IN RANGE UNITS



DRYERS



DISPOSING

Elliott Taylor

Elliott Taylor, nationally known gas industry publisher and editor, and former editorial director of Butane Propane News, died suddenly at his home in Gettysburg, Pa. on Christmas Day. He was 55.

Mr. Taylor had been a vigorous and colorful writer on gas and L. P. gas industry matters for more than 25 years, dating back to his first asso-

ciation with Jenkins Publications, Inc., publisher of Butane Propane News and Gas magazine. Since 1949, Mr. Taylor had been editor and publisher of American Gas Journal, a gas utility industry publication.

In 1938, Mr. Taylor collaborated with his wife, Kathrine Kressman Taylor, in the formulation of a highly successful book entitled "Address Unknown," a dramatic story written in the form of letters exchanged between a San Francisco importer and a colleague in Nazi Germany.

William E. Fagan

William E. Fagan, nationally known for his activities in the LPG industry for many years, passed away Dec. 12

in Los Angeles after an illness of 11 months.



Wm. E. Fagan

Mr. Fagan was vice president of the Mutual Liquid Gas & Equipment Co., Inglewood, Calif. He had been associated with his brother, Joseph, Mutual's president, since the

early days when the two brothers and Mrs. Joseph Fagan developed the company from a one pickup truck operation to a company selling fuel and appliances from southern California to Alaska and wholesaling manufactured equipment throughout the United States.

Will Fagan represented Mutual at many eastern conventions and important meetings and was widely known for his genial personality. He was a native of Nebraska, but had lived in Los Angeles for 42 years.

Albert G. Lindsay

Albert G. Lindsay, manager of Rockwell Manufacturing Co.'s export and international divisions, died in a New York City hospital Dec. 4 after an illness of four months.

Formerly manager of Crosley Corp.'s foreign division, Mr. Lindsay joined Rockwell last April, making his headquarters at Pittsburgh.

Arthur F. Benson

Arthur F. Benson, 58-year-old vice president of the American Meter Co., died late in 1953.

A graduate of Lehigh University and Massachusetts Institute of Technology, Mr. Benson was a captain in the Coast Artillery Corps during World War I. He was engaged in sales and engineering work in Seattle, Wash., and became associated with the American Meter Co. in January 1930. In 1950 he was elected vice president of engineering with headquarters in Erie, Pa.

Mr. Benson was affiliated with LPGA, NGAA, GAMA, and other national organizations and clubs.

Carter

Butane Propane



Carter

When you buy LP-Gas from Carter, you have the assurance of high quality and dependable service. Years of experience in producing and marketing LPG make Carter an unexcelled supplier.

THE CARTER OIL COMPANY
TULSA, OKLAHOMA

BUTANE'S HEATING POWER

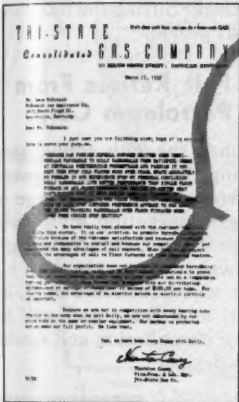
Zooms WITH Holly NarrowWall

Your customers are assured of maximum heat from L. P. G. with a Holly NarrowWall and its patented (#2602441) Secondary Heat Exchanger. You as distributor are assured of satisfied consumers. Tri-State of Kentucky, after two winter's experience, writes:



1. Holly NarrowWalls with Secondary Heat Exchanger are AGA approved from floor to ceiling. Saves vent material.
2. Holly's patented Secondary Heat Exchanger is AGA approved as integral part of the heater.
3. The extra warm air from SHE outlet is drawn from floor level, meaning better warm air circulation and distribution.
4. Burners are designed especially for L. P. G. gases.
5. Holly NarrowWall's efficiency is not affected by "pull down," thanks to its patented SHE and design.

★ ...really pleased with customer reaction to Holly this winter. It is our intention to promote NarrowWalls hard in the future because of customer satisfaction and because Hollies are so easy and inexpensive to install."



AGA approved under American Standards for Central Heating Gas Appliances.

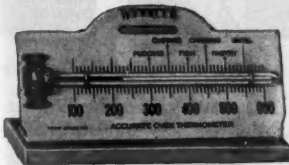
HOLLY MANUFACTURING CO.
917 S. Arroyo Pkwy., Pasadena 2, Calif.
Without obligation please send me complete facts about Holly NarrowWall designed for L. P. gases.

NAME.....
ADDRESS.....
CITY.....ZONE.....STATE.....

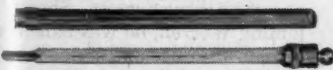
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G 4033—Pocket Refrigerator —30/120°



G 4035—Pocket Flue Gas

DEPENDABLE TOOLS CHANNELOCK PLIERS



420—Water Pump Type



424—Ignition Type

RATCHET & SOCKET



Speeds up 1/2" and 3/4" hex orifice changes.

THERMOSTAT ADJUSTING TOOL

G 4018—For min. flame and pilot on most oven controls.



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That Are Dependable

Get full particulars on our complete M-W line of cylinder and appliance trucks and dollies for simplified delivery service.

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Gas Fired Unit Heater

55,000 to 500,000 B.T.U.

FOR USE WITH
NATURAL, MANUFACTURED,
MIXED, LPG AND LP GAS-
AIR MIXTURES



CHEERFULATORS

Customers complaining of high gas bills? Cheerfulators will cut that heating cost substantially. Vented and fully automatic.

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ADAMS BROS. MFG. CO., INC.

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Van Horn Butane Service and United Liquid Gas Co. Consolidate

In accordance with an agreement of merger executed on Oct. 30, 1953, United Liquid Gas Co. and Van Horn Butane Service, both California corporations engaged in the liquefied petroleum gas industry operating in central California, became one corporation. This combined operation is now one of the largest distributors of butane and propane on the Pacific Coast, with storage and distribution facilities located in 38 towns throughout this area. The main office for Van Horn Butane Service has been located at King City with the main office for United Liquid Gas at Fresno. At the present time preparations are being made to move office facilities of Van Horn Butane Service to Fresno.

Under the terms of the merger part of the stockholders of United Liquid Gas received cash with a majority stockholder receiving the common stock of Van Horn Butane Service. At the time of the merger each shareholder of Van Horn Butane Service received one additional share of Van Horn Butane common stock for each share of Van Horn Butane Service then held. An additional 40,000 shares of Van Horn stock was issued to G. H. Bragg, the majority stockholder of United Liquid Gas for his holding in that firm.

The officers of the surviving corporation, Van Horn Butane Service, are: M. F. Van Horn, president; G. H. Bragg, vice president; Evelyn A. Van Horn, secretary; L. R. Holland, treasurer; Charles de Y. Elkus Jr., assistant secretary; George Woodbury, assistant treasurer and controller.

This company now operates 192 pieces of rolling equipment, including 26 transport units and 59 delivery tank trucks, and numerous other sales and service vehicles.

The new corporation now serves approximately 19,000 customers. There are outstanding at the present time over 7000 rent-and-lease tanks installed on the customers' premises, and total capacity plant storage is 805,000 gal.

The primary occupation of most of the inhabitants of the area in which this company operates is agriculture. The San Joaquin valley is characterized by small farms with a wide diversity of crops, while grain and livestock provide the principal sources of income to the inhabitants of the coastal area.

The "bread-and-butter" of this

firm is the sale of L. P. gas for domestic fuel requirements. However, other uses for the fuel are being developed as rapidly as conditions permit. An aggressive campaign of tractor conversion is under way, and the use of the gas for operating engine-driven irrigation pumps is developing. Approximately 125 tractor conversions have been made during the past six months. The sale of the fuel to dehydrators and cotton gins is an important factor during the late summer and fall period.

Howard Felt Retires From Warren Petroleum Corp.

On March 1, the 25th anniversary of his joining the company, Howard E. Felt, vice president in charge of the L. P. gas marketing division of Warren Petroleum Corp., Tulsa, will retire. However, even though his resignation was effective Jan. 1, he will remain a director and will be available for consultation and special assignment duties.



Howard Felt



G. L. Brennan

Mr. Felt joined the Warren organization in 1929 and, until the corporation's stock was admitted to the New York Stock Exchange in 1945, was one of its three owners. Shortly after joining Warren, he was named secretary, in 1941 became a vice president, heading the LPG division.

G. L. Brennan, manager of the LPG division for the past 12 years, succeeds Mr. Felt to the vice presidency.

Other resultant advancements include the promotion of Fred S. Schwend, formerly assistant manager of supplies, to manager of the division, and K. T. White, for several years head of the division's Houston district office, to sales manager.

Mr. Brennan has announced the following changes in the LPG division:

J. T. Bradley, formerly manager of the distribution department in Tulsa,

**LP-GAS Dealers everywhere specify S-L domestic tank valves for years of trouble-free service.
...and at no added cost.**

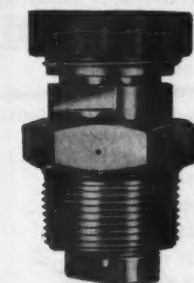


**ONE SOURCE
FOR ALL L-P GAS
VALVES**

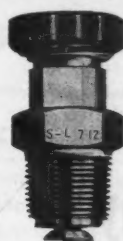
**S-L
DOMESTIC
FUEL TANK
VALVES**

Whether you're a tank manufacturer or an LP-Gas Dealer you can obtain from one dependable source, Selwyn-Landers, every valve required.

For every type of LP-Gas tank or cylinder our equipment is designed for years of dependable service. If you do not already have our catalog and prices send for them today.



S-L 612 FILLER VALVE
1 1/4" with double back check



S-L 712 VAPOR RETURN VALVE
3/4" with back check and excess flow check



S-L 1080 FIXED LIQUID LEVEL GAUGE
1/4" NPT with stop filling dial and tube



S-L 1434 SERVICE VALVE
POL with no relief



S-L SAFETY RELIEF VALVES FOR DOMESTIC STORAGE
500 to 1,000 gallons
1" and 1 1/4" NPT

The tank builders' choice of an LP-Gas valve is a very significant thing. **FIRST**, his choice must reflect the dealers' wants. **SECOND**, his reputation for building a good serviceable tank is at stake. **THIRD**, with ever-mounting costs, every penny saved both on actual cost of the valve and the cost of installation are all important.

Check around in the territory a little and you'll soon discover where the millions of S-L valves, gauges and fittings are going. They are going principally to LP-Gas tank and cylinder fabricators whose good name for reliable products depends to a surprising degree on the choice of valves and fittings.

You can't go wrong on S-L Valves. LP-Gas Dealers everywhere specify S-L domestic tank valves for years of trouble-free service... and at no added cost.



Also complete line of engine fuel tank valves.



**SELWYN - LANDERS
COMPANY**

4709 E. Washington Boulevard
Los Angeles 22, California

is manager of the district office at Houston, succeeding Mr. White; George W. Southworth succeeds Mr. Schwend as manager of supplies, and H. L. Willey succeeds Mr. Bradley at the Tulsa office.

Western Tank & Steel Opens Lubbock Plant

Western Tank & Steel Corp., recently formed by John R. Alexander and Al Costanzo, has opened its new tank fabricating plant in Lubbock, Texas. Production of the plant is de-

voted exclusively to the complete line of custom tractor and motor fuel tanks that can be installed in any model pickup truck bed in 15 minutes.

The tank features a "bonus outlet" that permits a simple hook-up for weed burners, branding irons, and camp stoves without disconnecting a valve. The 32-gal. tank comes complete with brackets, ready to mount. Extension brackets that put the top of the tank flush with the rear window are also available.

In addition to fabricating custom tractor and motor fuel tanks, West-

ern Tank is handling a complete line of LPG equipment and accessories, including carburetion equipment, safety devices, and fire extinguishers. A special department has been created to repair and service fire extinguishers.

Goss & Minns Install New 30,000-Gal. Bulk Plant

With the installation of a 30,000-gal. propane storage tank near McMinn Summit, south of Brockway, Penna., William T. Goss and Thomas J. Minns have opened their new LPG company to sell both gas and gas appliances.

In addition to the bulk plant, the company has a concrete block building equipped with compressors and equipment for filling 120 100-lb. cylinders per hour. The company at present has a stock of 2000 cylinders and a 1600-gal. bulk delivery truck which will be used to serve industrial accounts. The officials say that the firm is prepared to handle bulk and cylinder delivery upon both whole-sale and retail basis.

An appliance display store has also been opened by the company.

Pyrofox Becomes Unit of Parent Corporation

It was announced the first of the year by Union Carbide and Carbon Corp. that Pyrofox Gas Co., previously a division of the corporation, is now known as Pyrofox Gas Corp., and has become a unit of the parent corporation.

Officers are: Walter A. Naumer, president; Ross E. Roberts, vice president; Fred L. Shanklin, secretary-treasurer; and George C. Fritz, assistant secretary and assistant treasurer.

Those functions which have been handled by other divisions and departments of Union Carbide and Carbon will be consolidated in the new corporation.

Superior Refrigeration Expands Operations

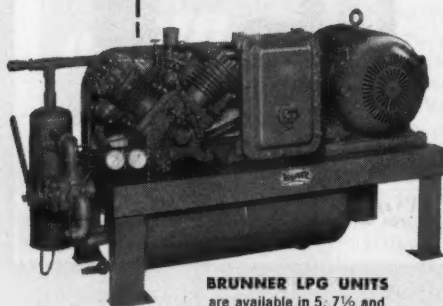
Superior Refrigeration Supply, Kansas City, Mo., has purchased all of the inventory of Century carburetion, Ellis Manifolds, and Santa Fe tanks from the Century Distributing Co.

Jack Krebs, former owner of Century Distributing, has joined Century Gas Equipment Co. He will continue to work out of the Kansas City territory.

You can pay for this



LP GAS TRANSFER UNIT



BRUNNER LPG UNITS
are available in 5, 7½ and 10 H.P. models — easy to install, easy to service.

— with the
GALLONAGE SAVINGS
you'll get
every time you
empty a tank car!

Yes, the savings in time and gallons (up to 540 gallons more from a 10,000 gallon tank car) soon pay for your Brunner LPG Transfer Unit—keep on paying big dividends every time you use it! The reason, of course, is that the Brunner Unit not only quickly transfers all liquid to your storage tank—but also removes and liquefies gas vapors remaining in the tank car. With a simple turn of a valve, residual vapors in the tank car are removed down to recommended pressures of 15 to 20 lbs. per square inch. See the Brunner LPG Unit—see why no liquid pump can give you such savings!



WRITE FOR FREE BOOKLET that shows how to set up a highly efficient "tank car to storage" transfer system—describes the many safety and long life features of Brunner LPG Units.

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The Brunner Co., Gainesville, Ga.

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**INDUSTRIAL
GAS COMPRESSORS**

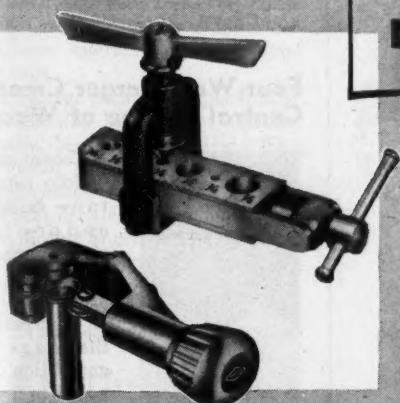
FOR *Safety* IN EVERY INSTALLATION DEPEND ON THE QUALITY LINE



IMPERIAL L-P Gas Fittings

... for tight connections every time

Accurately machined threads and seats — adequate wall thicknesses—flats for good wrench hold—consistent rigid inspection are a few of the Imperial quality extras that really count when you want to be sure of tight connections in every tubing job. Depend on Imperial's broad line of LP-Gas Fittings . . . they carry the Diamond "I" — your assurance of the very finest in tube fittings.



IMPERIAL Tubing Tools

... their quality speeds your work

There are Imperial Tools for cutting, flaring, bending, reaming, swedging. They are way out in front for easier, faster and better work. **No. 500-F** Rol-Air Flaring Tool rolls flares in the air and then automatically burnishes them to a high polish to produce the finest flares you have ever seen. Flares 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing. **No. 274-F** Hi-Duty Tube Cutter features free-wheeling ball-bearing action and enclosed feed mechanism. Integral reamer. Roller type with flare cut-off groove. For 1/8" to 1" O.D. tubing.



IMPERIAL Shut-Off Valves

... for assurance of dependable installations

It's good practice to install a good shut-off valve for each appliance. Imperial offers a quality line of plug-type valves . . . carefully ground to prevent leakage and to assure a positive shut-off. Available in a variety of sizes.

Catalog No. 621 describes **IMPERIAL LP-GAS Fittings, Tube Working Tools, Brass Pipe Fittings and Shut-off Valves**. Ask for your copy.

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In Canada: 334 Laurier Avenue, Toronto, Ontario

IMPERIAL

TUBE FITTINGS • SHUT-OFF VALVES
TOOLS for cutting, flaring, bending and swedging



Federal Fuel Tax Revision Proposed

Two bills of concern to the L. P. gas industry will come before Congress in its forthcoming session. These bills are Senate Bill No. 2238 by Senator Butler of Nebraska and House Resolution No. 5989 by Congressman Curtis of Nebraska. Both bills are the same. These bills propose to revise the present method of handling the manufacturers excise tax on gasoline (federal gasoline

tax) insofar as it applies to liquefied petroleum gas and other special fuels. The tax on L. P. gas would be imposed when it is sold to the operator of a motor vehicle, etc., for use as a fuel in the propulsion of such motor vehicle, etc., or when used by any person as such fuel unless previously tax-paid by the vendor. It also provides for refund in the event of subsequent non-taxable use. These bills were introduced in the last session and referred to the Committee on Finance.

Delaware Company Buys Conservative Gas Corp.



Harry N. Forman

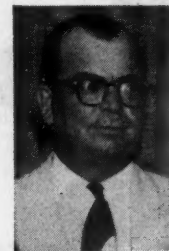
The Conservative Gas Corp. of Delaware, headed by Harry N. Forman, has purchased the L. P. gas business of the Conservative Gas Corp. of New York. Louis E. and Simon Seley, former owners of the

New York company, will hold a substantial financial interest in the business.

The New York company, in business 26 years, is one of the leading retail distributors of L. P. gas on the eastern seaboard.

Mr. Forman announced the appointment of the following officials of Conservative Gas of Delaware: Don L. Besanceney, operations manager; George A. Reeves, controller; and Carl A. Jacobson, sales manager.

Four-Way Merger Creates Central Butane at Waco



J. A. Farrar

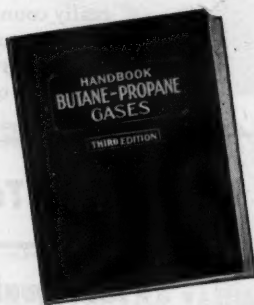
Recent merger of four retail butane businesses and one transport company into a single operation has resulted in creation of the largest organization of the kind in Texas, Central Butane Co. at Waco. The

merger was organized and worked out by J. A. Farrar (Bellmead Butane Gas & Appliance Co. at Waco) and brought into the consolidation his own firm with K. & G. Butane Co., Waco; Farmers Butane at Hamilton, Gatesville and Evant, and the B. W. Smith Butane Co. at Mart. In addition, Tru-Flame Transport Co. of Waco, came into the operation though it will continue to function as a separate corporation.

Heading the operation is Mr. Farrar as president. Other officers are L. W. Gardner of Hamilton, executive vice president and in charge of operations at Hamilton, Gatesville and Evant; Ed Gummelt Jr., senior vice president, in charge of purchasing and sales promotion, with headquarters at Waco, and B. W. Smith, vice president, in charge of operations at Mart and Marlin.

A. G. Oswald, who was with Bell-

HANDBOOK BUTANE-PROPANE GASES



- Up-to-date technical facts on LP-Gases.
- 352 Pages. Illustrated with Charts, Diagrams and Photographs.

Check this partial list of contents.

INTRODUCTION

The Progress of the Industry and the History of its Development.
The ABC of LP-Gas, an Introduction to LP-Gas Operations.

PHYSICAL AND CHEMICAL

PROPERTIES

Properties of the Hydrocarbons in LP-Gas.
Properties of Butane-Propane Mixtures
Volume Correction Factors
Analytical Determination and Testing

PRODUCTION OF LP-GAS

Natural Gasoline Plants, Recycling Plants, Oil Refineries

TRANSPORTATION AND STORAGE

Delivery by Truck, Rail, Water, and Pipe Lines
Storage Tank & Pressure Vessel Design
Liquid Metering and Pumping Systems

UTILIZATION OF LP-GAS

Comparative Performance with other Fuels
Appliance Installation and Testing
Domestic Applications
Commercial Applications
Industrial Applications
Enrichment, Peak Load and Standby Uses
A Fuel for Internal Combustion Engines

DISTRIBUTION OF LP-GAS

Installing and Servicing LP-Gas Systems
Semi-Bulk Systems
Bottled Gas Systems
Gas Utility Service from Central Plants
Multiple Utility Service from a Central Plant

REGULATIONS

N.B.F.U. Pamphlet No. 58 (1947).
Motor Carrier Regulations
Freight Regulations
Unloading Tank Cars
Marine Regulations

APPENDIX

LP-Gas Insurance
Handy Tables for Field Use
The Interchangeability of Other Fuel Gases with Natural Gases
Flame Weeding
Bibliography
Glossary of Terms

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Published by

BUTANE-PROPANE News

198 So. Alvarado Street
Los Angeles 57, California

mead Butane for a number of years prior to the consolidation, became secretary-treasurer of the new company.

Rufus C. Anthon Jr., is sales and merchandising manager, with headquarters at the main office and store in Waco. Operations of Tru-Flame Transport are in charge of R. A. (Bob) Whitley.

The operation is now established in the quarters formerly occupied by K. & G. Butane, 2225 LaSalle St., Waco. Warehouse facilities on rail trackage have been established and all merchandise for the retail stores of the organization is moved through this center.

Each of the six retail stores carries complete showroom stock but does not warehouse items of the inventory. Each branch office and store is connected with the headquarters office by radio phone, and all delivery trucks are similarly connected. Rolling equipment includes 17 delivery trucks (bobtails), 11 service trucks and many other vehicles. Five transports, each with 5000 gal. or more capacity, are operated by the Tru-Flame unit.

Bulk storage plants are operated at Waco, Marlin, Mart, Lott, Evant, Gatesville, Hamilton and Hico. The consolidated operation owns a one-third interest in underground storage at Fairfield, created a year ago by Mr. Farrar, Morris Sneed of Fairfield and U. C. Roney of Corsicana. This facility now provides storage for approximately 2 million gal. of L. P. gas and has ultimate capacity of about 10 million gal.

Merger of the four retail organizations brought between 5000 and 6000 retail gas customers to the operation and this list has been expanding rapidly since the consolidation.

Cylinder Retesting Requirements Liberalized

Further liberalization of cylinder retesting requirements is announced in National Technical Bulletin No. 3-53, recently published by the Interstate Commerce Commission. The bulletin reads, in part, as follows:

"Cylinders made in compliance with specifications ICC-4B, ICC-4BA or ICC-26-300, used exclusively for liquefied petroleum gas which is commercially free from corroding components, may, in lieu of the periodic hydrostatic retest, be given a complete external visual inspection at the time such periodic retest becomes due. When this inspection is used in lieu of hydrostatic retesting, subsequent inspections are required five years after the first such inspection."

1954...the big year for year 'round conditioning ..THE BIG YEAR FOR JANITROL DEALERS!

SUMMER COOLING IS HOT!

Hundreds of thousands of dollars of publicity and advertising have promoted year 'round comfort. Millions of people have visited summer cooled model homes during the past year.



NEVER WAS A MARKET MORE "READY"!

Now, to secure your profit from this fast growing market you have the Janitrol Summer Conditioner Units that can be "twinned" with new or old Janitrol LP Gas Fired Winter Conditioners, or simply install independently in domestic or commercial jobs. Also, the ease of adding summer cooling in the future is an important sales feature in selling Janitrol heating now. You can install Janitrol Summer Conditioners with the same confidence you've had over the years with Janitrol heating equipment.

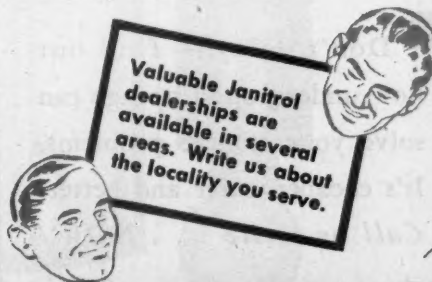


CHECK THESE FEATURES

Three models with 2, 3 or 5-ton capacities • hermetically sealed cooling unit • whisper-quiet, rubber mounted blower assembly • disposable fiber glass filters • extra thick acoustical-thermal insulation • complete accessibility from the front.



Valuable Janitrol dealerships are available in several areas. Write us about the locality you serve.



Janitrol Win-Sum Twins

JANITROL Division, Surface Combustion Corporation
400 Dublin Ave., Columbus 16, O.



tion and periodically at five-year intervals thereafter. Inspections shall be made only by competent persons and the results shall be recorded on a suitable data sheet, the completed copies of which shall be kept as a permanent record. The points to be recorded and checked on these data sheets are: date of inspection (month and year); ICC specification number; cylinder identification (registered symbol and serial number, date of manufacture, and ownership symbol if needed for adequate identification); type cylinder protective coat-

ing (painted, galvanized, etc., and statement as to need of refinishing or recoating); conditions checked (leakage, corrosion, gouges, dents or digs in shell or heads, broken or damaged footing or protective ring, or fire damage); disposition of cylinders (returned to service, to cylinder manufacturer for repairs, or scrapped); a cylinder which passes the inspection prescribed shall have the date recorded in the manner presently prescribed for the recording of the retest date, except that an "E" is to follow the date (month and year)

indicating requalification by the external inspection method."

According to information received in this office, the term, "competent persons," may apply to employees of the company using the cylinders who have been instructed in the proper method of examination. Activity to bring this about was initiated by LPGA.

GAMA President Optimistic About Future of Appliances

Enthusiasm for the future of the gas appliance industry was forecast by Sheldon Coleman, president of the Gas Appliance Manufacturers Assn., in his recent review and preview of 1953 and 1954. He has four reasons for predicting a bright future: (1) projected new home construction, (2) mass remodeling of older homes, (3) rapid expansion of the nation's gas system, and (4) continued conversion from competitive fuels.

Sales in all classifications of domestic gas appliances showed a substantial increase in 1953 over the preceding year. Househeating equipment (including central heating systems and individual room heaters) totaled approximately 3,070,000 units, an increase of 6.1%. Gas range shipments were up 3.4%, coming to about 2,250,000 units. Gas water heaters, totaling 2.2 million, were up 15.1%; and a greater rate of increase applied to shipments of gas clothes dryers and on-the-premises gas incinerators during 1953.

To help 1954 reach new highs, national promotional programs sponsored by the American Gas Assn. will use \$1,250,000 to provide a year-round campaign designed to give representation to every type of gas appliance. The promotion programs sponsored by AGA and GAMA will take care of the long-range bombing job, softening up sales resistance all over the nation. National advertising by manufacturers, expected to be greater than ever this year, will supplement the association operations throughout 1954.

Signal Oil Building Oklahoma Plant

Signal Oil & Gas Co. is building a natural gasoline plant in Carter county in the Fox-Milroy area of the Ardmore basin in Oklahoma to process 40 million cu. ft. of gas per day.

The plant will have a capacity of 100,000 gals. of L. P. gas and natural gasoline.

IN CHECKING OUR COSTS OF INSTALLING OUR OWN UNDERGROUND STORAGE, WE FOUND WE COULD HAVE HAD **SECURITY** UNDERGROUND STORAGE CO. DO IT CHEAPER!



Don't delay — find out how underground storage can solve your storage problems. It's cheaper, safer and better. Call or write . . . NOW!

Smiley Bill



SECURITY UNDERGROUND STORAGE COMPANY

PHONE 2-4067 615 SUNSET DRIVE WICHITA FALLS, TEXAS

She's Grateful

for HOT hot water...

Be sure she's grateful to you!

sell *White* WATER-HOTTERS

It's the surest way to complete customer satisfaction—because a *White* Water-Hotter means plenty of hot, HOT water always on tap! Look below for 15 reasons why *White* is your best bet for sound and profitable selling:

Write *White* today
for proved-profits story

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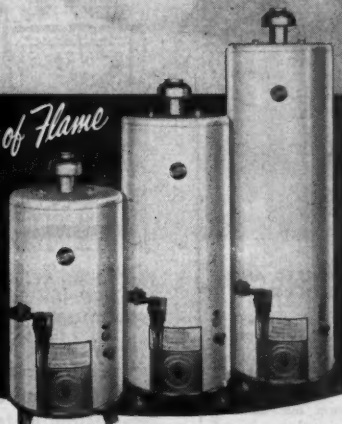
Dept. BP-2, Middleville, Michigan
Export Office: 201 N. Wells St., Chicago 6
Water Heating Specialists Since 1930



Film of Flame

Single port burner in gas Water-Hotter means NO clogging ever. Amazingly fast "pick-up" means PLENTY of hot water always.

Plus 14 Built-in Quality Features



20 gal. 30 gal. 40 gal. and 60 gal.



WATER-HOTTER
Automatic Water Heaters
for LP-GAS



Mutual

YOUR FIRST CHOICE



1. BROAD FLAME FOR PREHEATING AND MELTING — Perfect Combustion

2. MUTUAL AIR INDUCTION SYSTEM IS WIND PROOF

3. COOL HANDLE — WELL BALANCED

4. MUTUAL — The name to look for on a propane torch.

Here you have the finest torch for heating and melting designed and built by combustion engineers and expert craftsmen with years of field "know how." You can easily sell Mutual products to plumbers, utility and maintenance men with absolute confidence.

Demonstrate this torch to your prospect; let him light it, adjust it and work with it on a job or two — and you've made a sale.

The gas-air induction system located well back of the torch tip prevents flame from blowing out. The cool handle and excellent weight balance are sales points. In performance and appearance this torch is a tool your prospect can be proud to own.

Sell LP-Gas and Mutual torches and furnaces. You will make friends and build fuel accounts that will stay with you for years. Be sure to get our new catalog covering the complete Mutual line today.

5. FINGERTIP CONTROL

Member LPGA

Mutual

LIQUID GAS EQUIPMENT CO., Inc.

3638 WEST IMPERIAL HIGHWAY, INGLEWOOD, CALIF.

**YOU CHOOSE
RIGHT...
WHEN
YOU BUY**

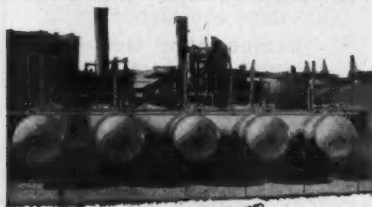


REGO LP GAS EQUIPMENT

- Rochester Criterion Gauges
- Hose and Fittings
- Weco-Trol (Automatic control)
- ICC Cylinders
- Okadee Valves
- Brunner LP Gas Compressors
- Liquid Pumps



NATURAL GAS STANDBY



BY **DRAKETOWN**

This packaged propane plant designed, engineered and built by Draketown, provides a completely interchangeable fuel for natural gas.

Draketown can design and build one for you, *within your budget*, to take over all or part of your load at the turn of a valve.

**STANDBY
AUGMENTATION
100% TOWN OR PLANT SUPPLY**

Serving utility and industry for over thirty years

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5-Second Leak Detector
Used By More Than
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CONVENIENT . . . 4 oz. bottle with dauber cap fits hand tool kit. No mixing. No waste.

SAVES MONEY . . . Reduces call-backs. Cuts fire hazards. Saves time.

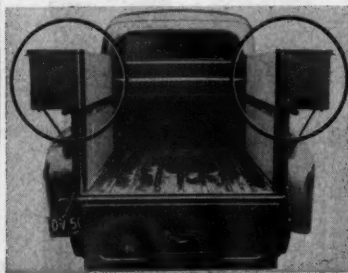
ALL TEMPERATURES . . . Regular for above freezing. Low-Temp for below freezing.

Try It . . . **FREE SAMPLE**

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(America's largest manufacturer of chemical-type leak detectors)

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KEEP YOUR TOOLS ORGANIZED AND
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Company _____
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City _____ State _____

KARYALL BODY, INC.
8221 Clinton Road Cleveland 9, Ohio
Department B

Servicing Controls

(Continued from page 50)

than the building next to it, strong wind will tend to form a down draft.

4. Clean the cone and socket of the thermocouple-pilotstat connection.

5. Re-connect the couple lead and check the operation. If a new couple is available, use it as a check against the old one. The thermocouple connection should be screwed finger-tight, plus one quarter of a turn with a hand wrench.

6. For investigation of pilot performance, a millivoltmeter is useful to obtain the exact voltage generated to indicate whether the proper voltage is supplied to the electro-magnet of the pilotstat. The millivoltmeter leads are connected to the thermocouple as shown (Fig. 11).

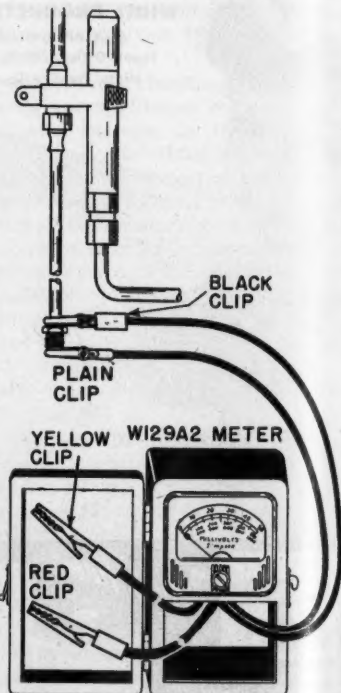


Fig. 11 — Millivolt Meter should be attached to the couple as illustrated; flame applied to the hot junction located at the tip of thermocouple.

Then with the pilot burner operating, measure the open circuit voltage. Allow at least five minutes for each meter reading.

Consult the instruction sheets for the individual type of pilotstat involved and check the millivolt output for normal pilot flame, for minimum gas pressure, for worst possible operating conditions and for the turn-down test.

CORRECTION, Please!

The location of the 100% shutoff safety pilot shown in Fig. 1, page 71, November issue, "Butane Propane News" is not correct. The shutoff safety pilot should be installed in the gas supply line between the automatic main burner control valve and the pressure regulator valve, as shown in the individual installation instruction sheets for shutoff safety pilots.—Ed.

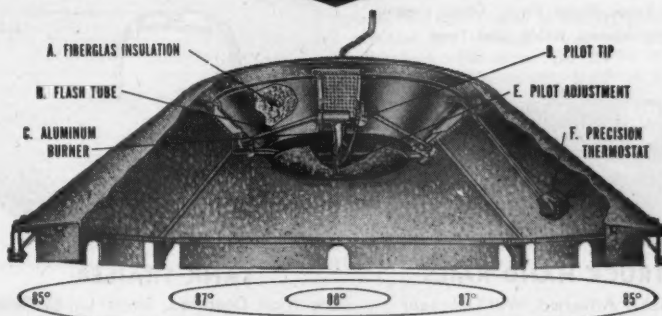
Going back to the common service calls, a no-heat complaint could mean that the 100% shut-off safety pilot had shut off. You would therefore find that the pilot flame had gone out or, for one of the reasons mentioned above, the pilot flame was still present, but not in condition to energize the tip of the thermocouple properly.

Important. If you found that the pilot had gone out, you should observe all of the safety precautions in venting the furnace before attempting to re-light the pilot. Follow the burner manufacturer's instructions to the last detail. If the burner manufacturer has provided instructions for the home owner in re-lighting the pilots, it is advisable to call these instructions to the home owner's attention, and demonstrate the procedure. Otherwise, be very careful to make it clear to the home owner and other occupants of the house that they are not to attempt to re-light the pilot under any circumstances without proper instructions.

If at any time there should be an indication of leakage of the safety pilot, it should be replaced immediately. Wherever there is any question of leaky connections, a soap bubble test is necessary.

On larger jobs where a greater volume of gas is involved, the trend is toward systems that can sense the presence or absence of the pilot flame electronically and thus give much faster response than is possible with the thermocouple. It is not within the scope of this article to go into the electronic systems. They are very similar to the simple basic systems described in the first article except that additional safety features are incorporated. The system consists of a relay that contains the electronic network for the flame sensing equipment, a relay unit that is operated from the thermostat and a safety switch to shut the burner down in case of ignition failure.

Stock the Gas Brooder with a PROVEN Sales Record!



25 YEARS OF LEADERSHIP MAKES A. R. WOOD Brooders Sell BEST Today!

The above cut-away drawing shows the reasons why A. R. Wood Radiant gas brooders are so dependable . . . why A. R. Wood brooders with a proven 25 year record of satisfactory service, have become the best selling brooders in the poultry business today!

- | | |
|--|--|
| A. Fiberglas Insulation . . .
retains heat better. Reduces operating costs. | D. Pilot Tips . . . of stainless steel. Are non-corrosive, non-clogging. |
| B. Flash Tubes . . . light all burners from one pilot should other pilots go out. | E. Pilot Adjustment . . . individual for each pilot light in the brooder. |
| C. Aluminum Burners . . . are removable. Easy to clean . . . easy to reassemble after cleaning. | F. Precision Thermostat . . . keeps temperatures constant under all weather conditions. |

Uses either liquefied petroleum or natural gas!

BUILD YOUR VOLUME WITH THE GAS BROODER THAT SELLS ITSELF!



Sell the brooder that *consistently* out-performs any other brooder on the market. Many years research and experience by the A. R. Wood Company has developed a brooder with superior design and performance features that pay off to you in sales!

Write Now For Complete Information!

A. R. WOOD MFG. CO.

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P. O. BOX 602-3

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P. O. BOX 97-3

BRINDLE EQUIPMENT

SAVES TIME, LABOR AND MONEY



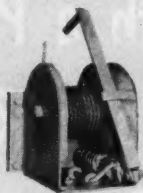
TRUCK TOOL BOXES

Holds Tools, Tube, Parts. Make money by saving miles and time.



TRUCK HAND RAILS

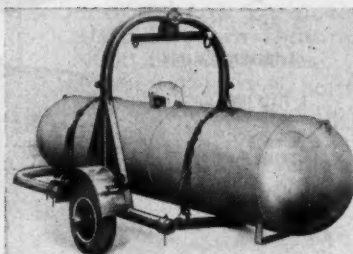
Quickly Attached. Will Out-wear Many Trucks.



— WINCH —

Two-Ton Capacity

Bottom or Side Mounted. Powerful — Long Lasting.



TANK TRAILER

One Man Operated. Saves Labor Costs. Repay Investment in Short Time.

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H & H EQUIPMENT CO. — LAOTTO, INDIANA

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FCC Proposes Restrictions On Two-Way Radios

The Federal Communications Commission, under Dockets No. 9703 and No. 10742, has published a notice of proposed rule making which would effect usage of two-way radio communication by L. P. gas dealers. The proposed rule would restrict installations to standard metropolitan areas of less than 50,000 population. At the present time installations are permitted in such areas of less than 500,000 population. Present licensees are given five years from the date of final action during which to amortize their equipment. Interested parties may submit comments either for or against on or before Feb. 5, 1954, in a written statement or brief in accordance with the commission's rules and regulations. Standard metropolitan areas are those areas defined as such in the U. S. Census of Population, 1953. In general these areas are counties.

Safety Answers

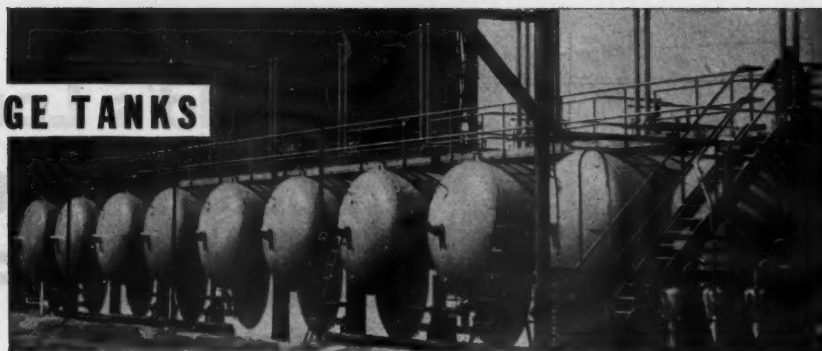
(Continued from page 60)

get the hose down and play a fine spray of water over the exposed end of the tank to keep it cool, and use it if necessary to protect the driver while he closes (1) the valve between the tank and the pump and (2) the first valve between the pump and the bulk truck. The truck should then be gotten away from the danger zone as quickly as possible. Procedure in step (1) will differ depending on the kind of valves available for this closure. Some plants have the extra protection of remotely controlled quick closing valves at the tank outlet—others have manually operated conventional valves without remote control. Here again the employees should know the best procedure with the equipment provided, and be trained in the proper steps to take in whatever emergency might arise. This calls for fire drills as a part of the company safety program.

Problem 6. This one is easy—she excludes air by covering the top of the waste basket with a newspaper, calendar, or anything else that will exclude air long enough to smother the flames. The man with the mop bucket has only to finish it off by drowning the remaining embers. (By the way, are your waste baskets the sheet metal or metal mesh type? The sheet metal type is better from every standpoint.)

10 OF A FINAL INSTALLATION OF 46 PROPANE STORAGE TANKS

fabricated by



TANK DIMENSIONS		
18000 GAL TANK	GROSS CAPACITY U. S. GALLONS	30000 GAL TANK
15480	APPROX. PROPANE CAPACITY GALLONS (86% OF GROSS)	25800
200	WORKING PRESSURE A.S.M.E. PAR U-69 CODE	200
94"	INSIDE DIAMETER, INCHES	106"
47'-4"	TANGENT LENGTH	62'-6"
51'-3"	LENGTH INSIDE TO INSIDE OF HEADS	66'-11"
25.4	WEIGHT TONS (APPROX.)	41.3

Propane Storage Tanks at DOWNINGTOWN are electric arc welded construction; welds spot checked with x-ray for 200# W.P., in accordance with Paragraph U-69 of A.S.M.E. Code for Unfired Pressure Vessels—Hydrostatic tested at 400# W.P. or 250# W.P. according to Paragraph U-201 of A.S.M.E. Code and the A.P.I.—A.S.M.E. Code. Construction meets Codes as specified above, National Board of Fire Underwriters and other approval agencies' requirements. We'll be glad to comply with your request for further details.



DOWNINGTOWN IRON WORKS, INC.
DOWNINGTOWN-PENNA.

STEEL AND ALLOY PLATE FABRICATION AND HEAT EXCHANGERS

DIVISION OF
PRESSED STEEL
TANK COMPANY



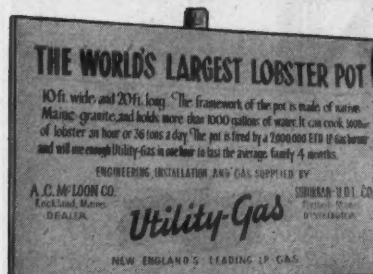
PROPANE TRUCK TANKS FOR ALL DELIVERY NEEDS

In streamline (illustrated) and walkway types, 1,181 gal. to 1,700 gal. water capacities. Constructed in accordance with A.S.M.E. Code, par. U-69, 200# w.p., or A.S.M.E. Code, 1950 edition, 250# w.p. Mounted on your chassis complete with valves, fittings, pump, hoses. Unit ready for immediate use when picked up. Write for details.

Also 500 gal. and 1,000
gal. Domestic Tanks
(Salem System)
Storage Tanks
Up to 8,000 gals.



McNAMAR AND CROWLEY, INC.
SALEM 5, ILLINOIS



World's Largest Lobster Pot Featured at Maine Festival

THE largest lobster pot in the world, capable of steaming 40 bushels of clams or 1000 lobsters at one time, was designed especially for the Maine Seafood Festival held annually in Rockland, Maine, when thousands of seafood lovers swarm into the fishing community for the three-day festivities.

The gigantic lobster pot was made by rebuilding two large water tanks and hinging three swinging doors to the upperside of each tank. The two tanks were embedded in a 10 by 20 ft. granite base.

The area underneath the tanks is hollow and a 2,000,000 Btu No. 3 Maxon Premix Burner kept over 1000 gals. of water in the two tanks scalding hot at all times. Fuel was supplied by 30 connecting tanks of bottled gas mounted on a wooden platform a short distance away from the lobster pot. Ninety to 100 lbs. of gas are consumed every hour during the daylight hours of the three-day event.

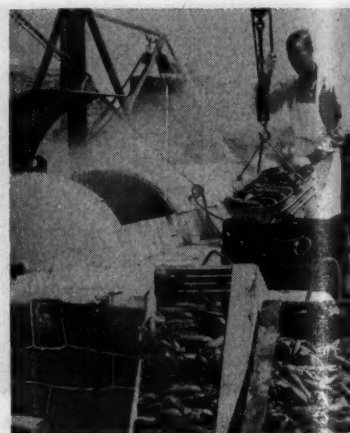
Pulleys lift and close the doors on the tank and a larger chain hoist on each side lifts baskets of clams or lobsters in and out of the tanks. Seven minutes are required to steam



World's largest lobster pot surrounded by portion of the crowd which waited in line to eat Maine lobsters. Note hoist arrangement for lifting covers and for lifting out baskets of clams or lobsters.

clams and 17 minutes on lobsters with this arrangement.

About 45,000 are fed in the three days during the festival. Visitors at last year's event consumed over 20,000 lbs. of lobsters, 350 bushels of clams, and 5000 lbs. of ocean perch. All except the fish was cooked in the world's largest lobster pot, which will be a permanent fixture and will be used each year during this annual event.



Above: Worker hoists tub of lobsters into steaming tank of water. Below: Russell Hall adjusts the 2,000,000 Btu burner used in heating the lobster pot.

Tandem setup of tanks is used to supply LPG for world's largest lobster pot which requires from 90 to 100 lbs. of gas per hour during operation.





Butane-Propane

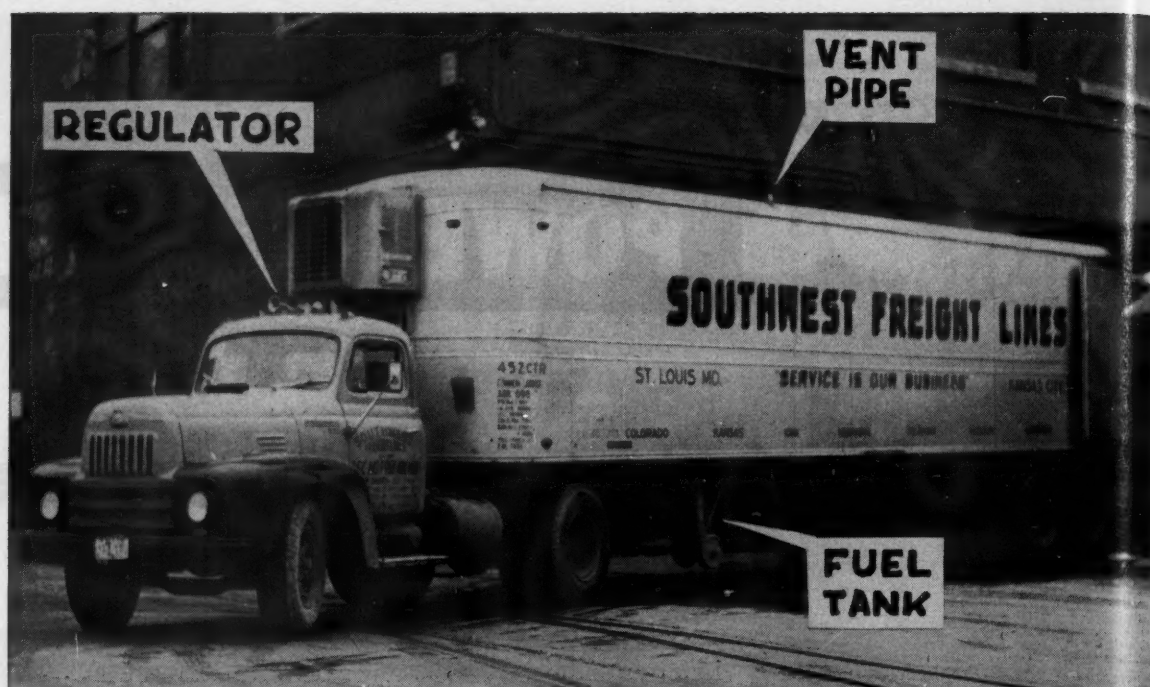
POWER SECTION

INSTALLATION • CARBURETION • SERVICING



Cooperation really paid off for salesman Don LaMee, Lee Redman Equipment Co., Minneapolis-Moline dealer, and representative Kenneth Boley, Butane Corp. (both of Phoenix, Ariz.). Last spring this hard-hitting team sold eight tractors equipped to burn L. P. gas, and related cultivation equipment, to Fred G. Hilvert Co., large-scale farming operators who farm a total of approximately 60,000 acres in Arizona and California.

The photograph shows the two M-M model UBN's and the six ZAN's which comprised this order, and one of the several "trap wagons" which the Hilvert Co. uses to service their tractor fleets in the field. Due to the long growing season and the extra power operations required by irrigation methods, these eight tractors should consume an average of about 8000 gal. each for the year. This will balance quite a number of domestic heating loads.



The three major items in conversion of a refrigeration engine from gasoline to L. P. gas are illustrated on the experimental unit of Southwest Freight Lines. Fuel tank is mounted under the trailer just to the rear of the dollies. Fuel runs to the regulator, just below the refrigeration unit on the front of the trailer. The vent pipe is attached to the fuel tank's pressure relief valve.

L. P. Gas Makes Ideal Fuel For Refrigerated Trailers

By R. T. Kingman

IN Kansas City, refrigeration mechanics for several major over-the-road trucking firms have been experimenting with a relatively unexploited use of liquefied petroleum gas—as a fuel to power the engines of refrigeration plants on modern refrigerated truck trailers.

Those experiments have now reached a point where at least two of Kansas City's leading refrigeration mechanics can say without hesitation that L. P. gas out-performs gasoline in every respect.

They add that the results of those experiments are likely to be far-reaching in scope, and may well create a new and booming market for butane-propane sales.

Here's what the two refrigeration experts—William C. Rabon, with Healzer Cartage, and Lester Evans,

with Southwest Freight Lines—have learned about the use of L. P. gas on truck refrigeration units:

1. Fuel costs are cut in half.
2. Maintenance costs are cut in half.
3. L. P. gas is dependable in all weather.
4. If properly handled, it's completely safe.

Those findings have been verified in actual over-the-road use. Both Mr. Rabon and Mr. Evans are so "completely sold," they say, that both firms plan to use LPG power on all refrigerated trailers on their lines.

And what's more important, the drivers themselves like L. P. gas-powered refrigeration systems. They want it on their company trailers, and those drivers who own their own rigs are getting the new systems when they trade in.

What does all this mean for the trucking industry? Because of Kan-

sas City's peculiar location and position in the trucking field, it may mean a lot.

For one thing, Kansas City is one of the largest trucking centers in the nation and is a natural transportation hub for much of the agricultural and industrial midwest. There are, for example, more than 3500 trucks operating into Kansas City every day, and those trucks fan out in all directions. So what happens in Kansas City has a pretty big impact in the trucking business.

Another reason for Kansas City's traditional influence in the national trucking field is that the midwest offers the best possible circumstances for exacting tests of something new. Temperature ranges are tough (winter runs to Wisconsin, summer runs to Texas), and the stakes are high.

Kansas City does a lot of refrigerated hauling under rigorous condi-

tions. Meat and medical supplies from Kansas City packing houses are tough to handle. Vegetables from midwest truck farms are tricky cargo. And some of the return loads—like food concentrate—require delicate temperature control.

Strawberries, for instance, are carried through the blazing 100°-plus heat of Kansas prairies, with a 2000-cu-ft trailer maintained at a constant temperature of 15° below zero. L. P. gas has done jobs like that.

Sometimes the refrigeration units have to work even harder than that. Meat, for instance, may be received at a temperature of 50°, and the unit must bring it down to 35°—right away. There's lots of money involved; a cargo of choice beef may run to \$100,000.

Add to that a \$3500 refrigeration unit, a \$10,000 truck tractor, and a \$15,000 trailer, and you have a sizeable amount of money rolling down the highway. Modern truckers don't take chances. The refrigerating systems must be dependable, and the fuel safe.

Those were the conditions under which L. P. gas proved itself in the Kansas City experiments. Both Mr. Rabon and Mr. Evans have proceeded carefully, keeping accurate records all the way. Here are some of the specific things they've discovered:

Healzer Cartage is saving an average of \$1000 a year per truck on fuel costs alone. The four experimental trucks total 288 Wichita-to-Chicago trips per year; an average of 72 runs per truck.

In Kansas City, L. P. gas costs about 10 cents a gal. Ethyl gasoline, used to power the Thermo-King refrigeration units used by both Healzer and Southwest, costs from 23 cents to 27 cents a gal. The hours-per-gallon rate is about the same for the two types of fuel, the mechanics have found.

They have learned that a tankful of LPG is enough fuel supply for most midwest runs. Southwest Freight Lines' experimental trailer has run for more than a full month (in moderately cold weather) on \$2 worth of fuel. That stretch of time between fuel stops is a factor drivers like—they don't have to worry about their refrigeration unit.

Maintenance costs have dropped. One of Healzer's four experimental trucks went 150,000 miles without an

overhaul of the refrigerator engine. Another has gone 180,000 miles and still is running, without showing signs of needing an overhaul.

Units using gasoline normally are overhauled at about 75,000 miles—twice as often as with L. P. gas. That means, Mr. Rabon explains, that a maintenance crew now can keep twice as much refrigeration equipment on the road without additional employees on the staff.

As to engine wear, they haven't arrived at figures yet—because so far they haven't been troubled by wear.

Mr. Evans put his experimental unit in brand new. After three months, he reports, it still looks brand new. "No wear at all," he says.

Because LPG is a dry fuel, the mechanics point out, there is no crankcase dilution, less carbon deposit. And that means clean head, pistons and rings, and much less wear for walls, bearings and valves.

Oil changes for the L. P. gas system are made every 5000 miles. With gasoline, changes were made every 2500 miles. The only thing to remember, the mechanics say, is that L. P. gas tends to cause oil to thicken, and mechanics should use a lighter grade when additional oil is required.

Mr. Rabon now is working on an arrangement that will further stretch out oil change periods. He'll take the gasoline tank that comes with the refrigeration units and use it as an extra reservoir for oil. He figures he will have to change oil only every 15,000 miles, because the capacity will be increased from three quarts to five gallons. Under that arrangement, he plans to change filters every 5000 miles.

How much of a job is it to convert a gasoline refrigeration unit to an L. P. gas system? Mr. Rabon figures it takes about 12 hours' time for the conversion, costs less than \$200 for materials and parts, and about \$70 for labor.

Here are the steps in converting from gasoline to L. P. gas at Mr. Rabon's shop:

1. Install the L. P. gas tank under the trailer.
2. Install a vent pipe.
3. Install a fuel line, and dryer, to the regulator.
4. Mount the regulator.
5. Attach fuel and balance lines.
6. Modify, or replace, carburetor.

Here are the details on the conversion operation:

Mr. Rabon uses a 61-gal. tank. He fills it about 75% full for summer



Marion Parks of Southwest Freight Lines checks the pressure on the L. P. gas regulator on the front of the line's experimental trailer. The view shows the standard arrangement in Kansas City tests, with the regulator on the battery box below the refrigerator engine.



William C. Rabon explains how a gas-engine carburetor on a refrigeration unit is modified for L. P. gas. Notice the two spud-ins on the carburetor.

operation and 90% full for winter operation. The tank costs \$102. The tank is supported by hangar brackets which are bolted to the trailer undercarriage in the most protected location, just to the rear of the trailer dollies.

The vent pipe goes from the tank's pressure-relief valve, up through the sides of the trailer, extending about 2 in. above the roof of the trailer. It has a rain cap. The vent pipe is heavy-duty, double-strength pipe. It must comply with ICC regulations.

The vent pipe is installed from the inside of the trailer. A portion of the inside wall is pulled off, the insulation material pushed aside, and the pipe installed in holes in the floor and roof. The holes are sealed with caulking compound and plates, and the wall replaced.

One fuel line runs from the fuel tank to the regulator. For that purpose, Mr. Rabon uses extra-heavy copper tubing with 49/1000 wall thickness. He installs a dryer on the main fuel line ahead of the regulator.

Mr. Rabon uses a Spartan rechargeable dryer, which absorbs moisture through the use of silica gel, which can be reprocessed when it changes color. But he has not yet had to change the silica gel in dryers on his four trailers. There isn't that much moisture.

Because the tanks are hydrostatically tested for leaks following manufacture, and a certain amount of moisture invariably remains in a new tank, he always adds 2 or 3 gal. of alcohol to the first tankful.

The regulator is mounted on the battery box just beneath the outer portion of the refrigeration unit on the front of the trailer, a convenient location. The regulator bracket is bolted to the box.

Mr. Rabon uses the Garretson carburetion system on his units. This system requires two lines, a main fuel line, and a balance line from the regulator to the carburetor. The carburetor has to be modified, or replaced. He spuds in the two lines to the carburetor that comes with the refrigerator engine. He removes the choke, needle and float. Engine speed is controlled by the same throttle mechanism that was used with gasoline.

The U. S. Thermo Control Co., Minneapolis, Minn., sells L. P. gas conversion kits for all its Thermo-King models. A \$59.75 kit includes a fuel controller, high pressure regulator, solenoid valve, pressure gauge, low pressure hose, pipe nipples, and hose clamps.

Kits Sell For \$68

Complete L. P. gas carburetors which may be used to replace gasoline carburetors come in kits that sell for \$68, including all the equipment listed above. Both Mr. Rabon and Mr. Evans say they'll do the carburetor modifying on their own, as they begin to outfit their entire refrigerated trailer fleet with L. P. gas systems. It's a simple job, they say.

Southwest Freight Lines and Healzer Cartage use different Thermo-King models. Southwest uses the model K, with the Onan Model C K engine. Healzer uses Model R, with a Crosley engine. The refrigeration mechanics think their respective models are superior to each other's. But there's one thing they agree on—L. P. gas works perfectly in both models. And they think it would be just as well in any kind of internal combustion trailer refrigeration unit.

Mr. Rabon is working now to complete installation of L. P. gas systems on 13 more Healzer refrigerated trailers. Mr. Evans says that Southwest eventually will install L. P. gas systems in the refrigeration units of 125 trailers.

At least a dozen other trucking firms in the Kansas City area have shown interest in their results. Some six other lines in the area are trying experiments of their own.

That contrasts with the situation a few years ago in Kansas City when there was little sentiment in favor of the L. P. gas system for refrigerator units.

Mr. Rabon, who was one of the pioneers in placing the new theory to practical tests (after it had been worked out by Thermo-King men on a tentative basis), met opposition in his own shop.

"When anything went wrong," he recalls, "the first thing the drivers thought about was that it was L. P. gas that was doing it. 'Get that gas off of here and it'll be all right,' they'd tell me. They'd say that before they even thought of testing anything else. Now they're convinced that butane and propane give smoother, cleaner service. They want it on all units."

There were scoffers on other truck lines, and Lester Evans of Southwest was one of them. "I was convinced it was a jackleg idea," he admits. "But I gave it all the tests I could think of, and now I'm behind it all the way."

One of the major points of opposition was the belief that L. P. gas would "freeze"—not generate enough gas for fuel—at low temperatures. Mr. Evans and Mr. Rabon use straight propane in cold weather and a 50-50 mixture of butane and propane in warm weather, when temperatures are generally above 40°.

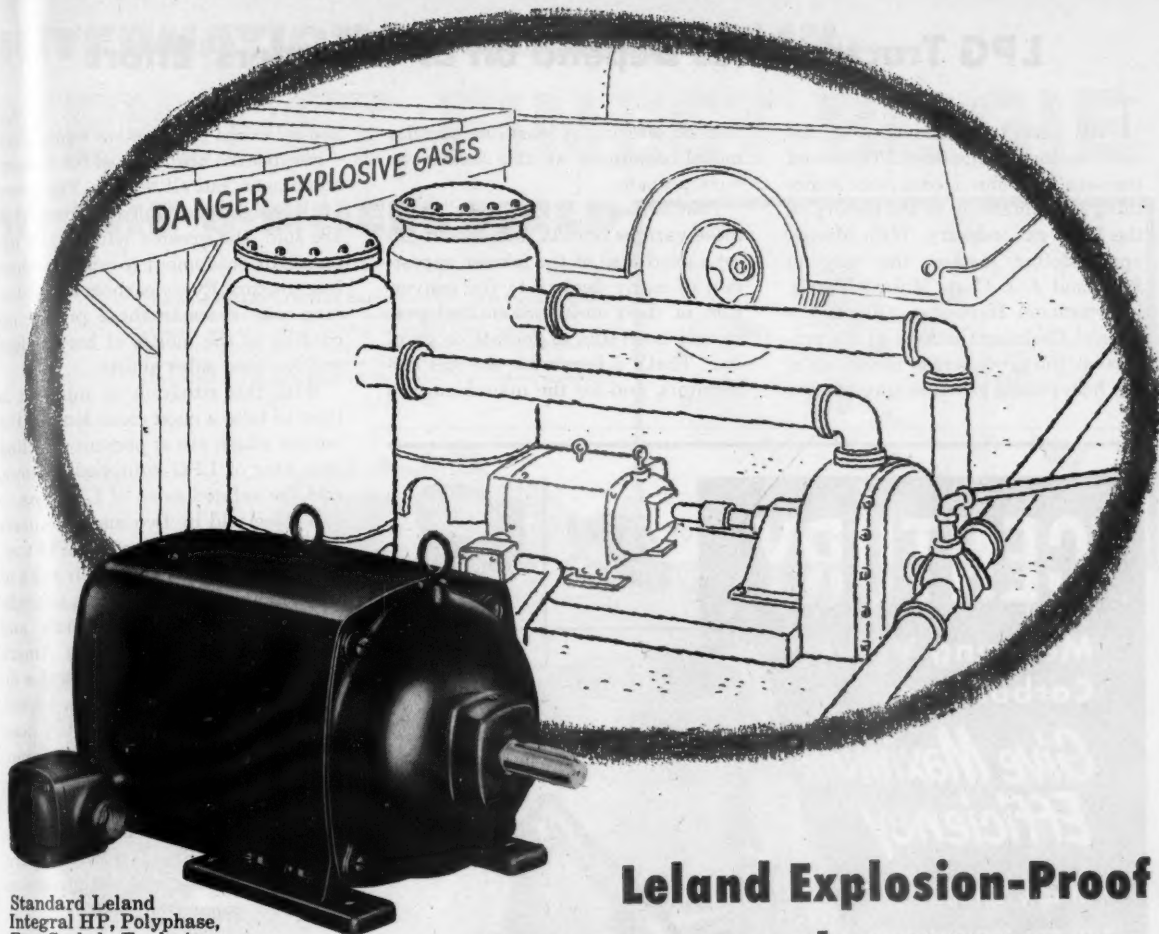
"I've run my experimental trailer for a month," Mr. Evans reports, "trying deliberately to get the fuel system to 'freeze.' I'm convinced it won't, and I'll swear by it even at 20° below."

Both men list four major points that refrigeration mechanics should remember in thinking about L. P. gas systems for their units:

1. Make sure the tank is properly vented.
2. Make sure the tank is thoroughly pressure-tested.
3. Know the hazards of L. P. gas, and how to handle it safely.
4. Learn the chemical characteristics of butane and propane.

Mr. Rabon wants to prepare a "trouble shooter" chart for L. P. gas systems, as a guide to other mechanics. Both he and Evans hope that mechanics all over the nation will investigate the benefits of L. P. gas, as they did.

If other mechanics follow the lead, some observers feel that the trucking industry as a whole will reap bigger profits, and that a sizeable market will evolve for butane-propane sales.



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LPG Tractor Sales Depend on LPG Dealers' Effort

THE recent introduction of the new factory-equipped LPG model tractors by John Deere was something of a milestone in the history of the L. P. gas industry. With Minneapolis-Moline leading the way in 1941, and J. I. Case, Massey-Harris, International Harvester, Oliver, Cop, and Cockshutt joining in the procession, the producers of nearly all of the heavy-duty gasoline tractors are

now all offering at least one popular model equipped at the factory to burn propane.

That makes L. P. gas "right" in all these various brands, and should offset a good deal of the former opposition of many dealers to the conversion of their units which had previously been sold to operate on gasoline. That's a break for the gas distributors, and for the manufacturers

and sellers of carburetion equipment—not just the brands used for factory equipment, but all brands. The more of the factory-equipped tractors that are sold, the greater will be the demand for equipment to convert gasoline tractors. Every carburetion salesman may share in these profits, according to the merits of his product and his own sales ability.

With this situation in mind, it is time to take a good clear look at the factors which are at present affecting the sales of LPG-equipped tractors, and the related sales of L. P. gas.

We are told by two manufacturers who have been producing LPG tractors for some time that their sales of those models have come to a screeching halt around the eastern and northern parts of the Great American Tractor Belt. They blame this directly on the L. P. gas distributors. They claim that in many of the cases that they have investigated, the purchasers of new L. P. gas tractors have been penalized by an increase in the cost of fuel during tractor season. Whether or not this is a true picture, that is what these manufacturers report, and apparently believe.

Another Side of Picture

On the opposite side of the picture, we find that all over the country the L. P. gas distributors are crying that the tractor dealers are making no effort to sell their LPG tractors in preference to gasoline models. They deliver whichever model the customer asks for, but make no effort to influence his choice of fuel. Well, what does a tractor dealer gain by selling a model that operates on LPG instead of gasoline? A profit on the customer's purchases of fuel? Not unless the tractor dealer is also in the liquid fuel business. More service work in his shop over the ensuing years? Definitely not. A more satisfied customer? Probably, but he cannot put that gain in the cash register until the customer buys another tractor. The one thing that the tractor dealer can point to as extra profit now or in the near future is the margin on the extra purchase price of the factory-installed LPG equipment.

Time was when a tractor salesman offering an L. P. gas model could sometimes utilize that advantage to

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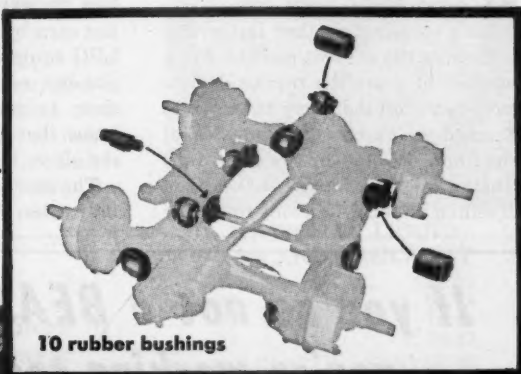
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GVW ratings, 22,000 to 90,000 lbs. with new INTERNATIONAL bogie or trailing axle. Engines from 130 to 356 horsepower. Choice of gasoline or LPG power. Diesel engines available in models with GVW ratings of 30,000 lbs. and over. Transmissions, axle ratios for any needs. America's most complete truck line—170 basic models from ½-ton pickups to 90,000 lbs. GVW off-highway models.

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take the sale away from a competitor who had no LPG model to offer. In the heavy duty field those days are gone. The customer can have his choice of either fuel, and in many cases he can even get a diesel engine if he wants it.

Let's consider another factor that influences the present market. For a number of years the tractor dealers have been "on the gravy train," with demand in excess of supply. That condition no longer exists. Many tractor salesmen outgrew the habit of selling because for a long time they

could only be order takers, not unlike many salesmen in our own industry. It will take time for them to adjust their habits to constructive and creative selling, which is hard work. It may be some little time before the extra commission that they can earn by selling the higher priced LPG equipped tractor instead of the gasoline equipped model will move them to make the extra effort. We know that there are exceptions, but the above is still true in many cases.

The matter of competition between industries also enters into the mar-

keting picture—competition between gasoline and L. P. gas. Every time an LPG tractor goes into service, the gasoline boys lose some more business that they once enjoyed, or that they hoped to get. It is an odd facet of human nature that most of us will fight twice as hard to keep what we have as we will to acquire something new. Naturally, the gasoline people do not like to lose business. They do what they can to prevent it, not only with the customer, but also with the tractor dealer, who is also their customer for oils, greases, and other petroleum products. The gasoline distributor uses every possible method, including development of personal friendship, to get and hold that tractor dealer's business. If you were a gasoline distributor, you would look at it exactly the same way.

Aggressive Selling Required

The gasoline man is not going to let up in his efforts to keep tractors operating on gasoline. Nor can we expect much help from the oil companies which produce both L. P. gas and gasoline. It is true that they suffer from the same seasonal unbalance that plagues gas distributors. But L. P. gas is, to most refiners, a minor product that does not bring a profit comparable to that from gasoline, which is their major product. If they must lose the profit on one product or the other, it is going to be the one that leaves them in the best financial position in the end. It is up to the L. P. gas industry to sell L. P. gas—nobody else is going to do it for us, because nobody else makes a profit on the transaction.

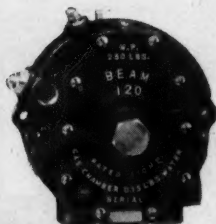
We consider now one final fact—the gas distributor's profit following the sale of an L. P. gas tractor. During its normal lifetime that tractor can be expected to burn between 30,000 and 60,000 gallons of fuel. At the LPG distributor's standard margin the sale of that fuel represents several times as much profit, either gross or net, as the manufacturer made on the production of the tractor, or the dealer made on its sale. On that one tractor, the fuel supplier's profit can be several hundred dollars, nicely distributed over a period of years, plus the extra benefits derived from a better balanced load.

Let's face it frankly—until tractor dealers see more in it for themselves

If you're not a BEAM dealer you're working too hard

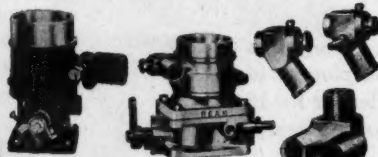


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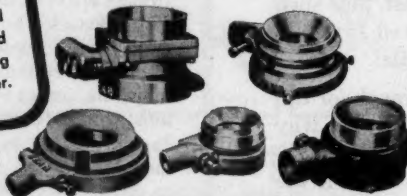
WITH THE BEAM SYSTEM OF L.P.G. CONVERSION

BEAM equipment is noted for its extreme simplicity and compact design, resulting in quicker, more profitable installations, with a minimum of service required over the years. Whatever your preference of carburetor—adapter style, straight LP carburetor, or spud-in—the BEAM line contains them all. Only one hose is required between the regulator and carburetor. Two simple adjustments—idle and load settings—do the entire job, and no special technique, such as priming or choking, is required of the driver.

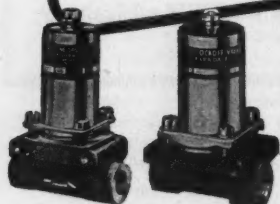


STRAIGHT L.P.
CARBURETORS

SPUD-IN
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The entire industry looks to BEAM as their dependable source of supply for electric solenoid valves. Available in various models in 6 and 12 volt d. c. for both Butane-Propane and Gasoline fuel lockoff.

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than most tractor dealers now see, there will be little effort on their part to influence the customer to choose L. P. gas instead of gasoline. Our industry must continue to create the demand for both new factory-equipped LPG tractors and conversions, and we must do this against the competitive efforts of the gasoline marketers.

This calls for aggressive selling, right down at the grassroots. In every agricultural community farmers are buying new tractors, or are looking toward the day when they can buy new ones. They will generally discuss their impending purchase with the L. P. gas deliveryman or salesman before they contact the tractor dealer. They are quite certain to do so if they have used a satisfactorily converted tractor, or if they have previously been given an effective sales talk on the advantages of LPG fuel. This is your golden opportunity. You want to be able to swing the deal to a tractor agency that is willing to cooperate with you to the limit.

Since you have no means of controlling the customer's choice of the make of his new tractor, it appears

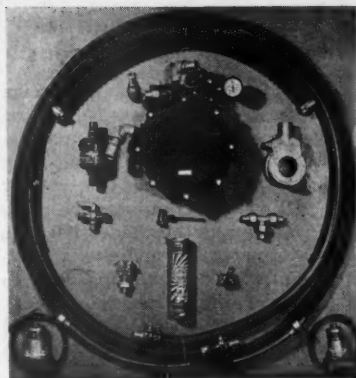
that you should be on a friendly and cooperative basis with all the tractor dealers in your territory who will allow you to develop that kind of relationship. There is nothing else quite so effective in developing business friendships as helping to find customers.

You need the cooperation of all of your tractor dealers. If any fail to respond to neutral friendship, your course is clear. You are no longer neutral. You work with the dealers who will play on your team. But you still carry the major part of the burden of selling the user on L. P. gas.

Los Angeles Truck Show to Include LPG Equipment

Dates for the 1954 Truck, Trailer, and Equipment Show, to be held on June 24-27, inclusive, have been announced by the Automotive Council of Los Angeles.

This is the largest show of the kind in the West, and each year it features a large display of L. P. gas carburetion equipment and LPG-powered trucks, engines, and construction equipment.



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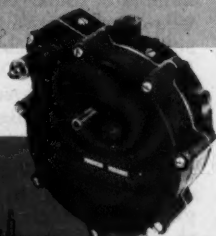
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LPG
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Area tests show that the average LP gas tractor uses approximately 3,000 gallons of fuel per season. This in comparison to the 1,000 gallon average in domestic installations. Boost fuel sales by selling LPG conversions to the big farm tractor market. Conversions are simple . . . Marvel-Schebler equipment plus a tank is all you need! Buy Marvel-Schebler LPG carburetion systems for every engine use.

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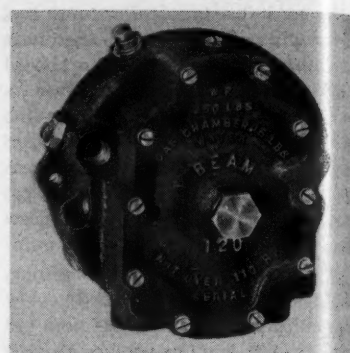


New Regulator Simplifies Small Engine Conversions

A new regulator of compact design and light weight, which is said to simplify conversions and reduce installation costs on small engines, has been added by the Parkdale Co. to their line of Beam LPG automotive products. Known as the Model 120, this regulator-vaporizer includes a built-in vacuum lock-off, making a solenoid fuel valve unnecessary. It is designed with three fuel outlets, and may be connected to an adaptor type

or a straight butane carburetor, or to a simple spud-in attachment consisting only of a pipe nipple and the necessary dry-gas hose. Fuel adjustment for the spud-in type installation is built in at the regulator outlet.

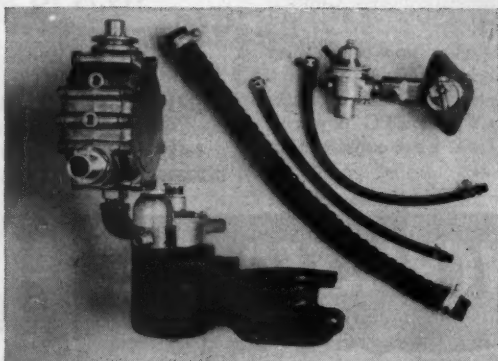
As was the case with the Beam Model 400 regulator, which is continued in production, idle adjustment is incorporated in the regulator. This eliminates the need for idle plates and idle tubes. With capacity up to 120 hp, the new regulator mounts with only two screws, and requires no electrical connections. It is de-



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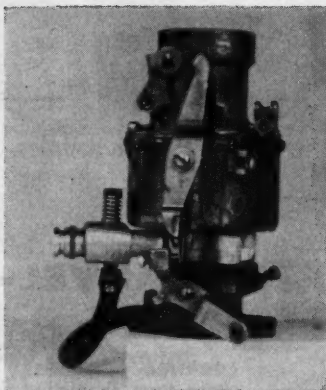


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signed to be adaptable to a wide range of small engine applications, from taxicabs and door-to-door delivery units, fork-lifts and tractors down to small industrial engines, pumps, and electric light plants.

Increase in Bus Industry Sales Volume Predicted



Hugo Young

On the basis of industry estimates and recent market surveys, Hugo Young, president of the Flexible Co., predicts a 20 to 25% increase in bus industry sales volume for 1954.

An important factor in his predicted 1954 increase is that bus operators, during the past few years, have not purchased their normal number of replacement units because of the steady decline in the number of riders since the war and delay in adjusting bus fares to inflated operating costs. As a result, transit company incomes declined sharply for several years prior to 1953.

During 1953 an increasingly large number of transit companies secured fare adjustments and began to show substantial financial gains. These firms undoubtedly will invest a major portion of their profits in new and improved equipment.

Today, there are about 56,000 buses in city transit service alone. Based on a maximum life expectancy of 14 years per vehicle, about 4000 buses should be purchased annually for replacement.

Among the sure transit developments for 1954 will, Mr. Young believes, be general expansion in the use of propane as a bus fuel. Propane's low cost, freedom from obnoxious odors and smoke, and overall efficiency make it the perfect transit fuel wherever it is readily available.

Philgas Advertises Tractor Fuel to Farmers

During December the Philgas division of Phillips Petroleum Co. used half-page advertisements in state and regional farm magazines, circulating to farmers in Arkansas, Louisiana, Mississippi, Kentucky, Tennessee, West Virginia, New Mexico, Nebraska, Kansas, Missouri, and Colorado.

These advertisements featured the economy of the company's L. P. gas as truck fuel, and promoted the conversion of tractors, or replacement with new LPG burning tractors, during the winter season.

One-Third of Hall-Scott Production Is for LPG

From the original experimental conversion of a single engine used in 1931 to power an engine-driven rail car, Hall-Scott's sales of L. P. gas-equipped engines has steadily grown until it now includes about one-third of the company's production, according to J. D. Towne, manager. The company's engine business in 1953 was about 40% higher than in 1952 and 80% above the 1951 figure.

Hall-Scott LPG-equipped engines are widely used as power plants for heavy freight and industrial applications in the West and Southwest, and nationally used in intercity and city service busses.

Danish Company Has Cargo Ship In LPG Operation

An L. P. gas carrier ship was completed late last year in Marstrand, Sweden, for A/S Kosangas of Copenhagen, Denmark.

The ship will carry 320 tons of L. P. gas in 12 containers standing in beddings on the tank top, which is located amidship. The gas fitting is tested to 28 atmospheres. Free cargo space under the deck between the gas containers is fitted with suitable fire-fighting equipment.

The new motorship the *Rasmus Tholstrup*, is more than 165 ft. long.

Commercial LPG Engines Described in New Bulletin

Fageol Products Div. of Twin Coach Co. announces a new bulletin on the company's complete line of commercial Fageol LPG engines for operation on low-cost propane or butane fuels.

Printed in two colors and suitable for punching to fit standard three-ring binders, the six-page bulletin covers horizontal and vertical models

of the 404, 451, and 477 cu. in. Fageol LPG engines.

Copies of Bulletin L-8679 are available on request to Fageol Products Div., Twin Coach Co., Kent, Ohio, or to Twin Coach representatives in principal cities.

Changes Recommended In Pamphlet 58

The Technical and Standards Committee of the LPGA, A. H. Menuet, chairman, has submitted recommendations to the National Fire Protection Assn. for changes in Pamphlet 58 which will be of particular inter-

est to those interested in the distribution and use of LPG as motor fuel.

The proposed changes include the recommendation to add a new section covering standards for L. P. gas service stations, that Div. 6 on cylinder systems for cooking and heating installations on highway vehicles be revised to cover cargo temperature control equipment, and that standards for portable engines in buildings be incorporated in Div. 4, which covers motor fuel uses of L. P. gas. These proposed revisions have been sent to the NFPA Committee on Gases for consideration and action.

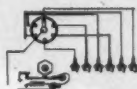
Your Satisfaction with LP-Gas as an Engine Fuel depends on these 5 points



1. COMPRESSION RATIO—LP-Gas with an octane rating of over 120 requires compression pressures greater than for best Ethyl gasoline before maximum power and fuel economy can be obtained. Lower compression pressures do not utilize LP-Gas to its best advantage.



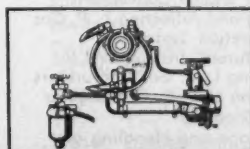
2. INLET MANIFOLDING—A cold inlet manifold is a "must" for LP-Gas. A hot manifold tends to pre-expand the mixture before it enters the combustion chamber, resulting in shortage of power and lower top speed. Consult your Ensign representative.



3. IGNITION—Cold spark plugs for higher compression. The rate of burning for LP-Gas is slower than for gasoline, hence longer power impulses. BUT ignition must be advanced on the timing cycle.



4. COOLING WATER—Water temperatures not only must be up but water pump must be adequate to circulate hot water throughout the LP-Gas vaporizer. Poor circulation noticeable by formation of frost on the vaporizer reduces output of vaporizer and lowers horsepower output.



5. CARBURETION EQUIPMENT—Vaporizer must have adequate reserve capacity. Must produce large volumes of LP-Gas vapor of uniform density—no alternating wet and dry "slugs" of fuel to cause erratic operation. Carburetor must provide easy starting plus correct air-fuel ratios for every variable load and speed. Carburetor must stay in adjustment once properly set. ENSIGN equipment does all this plus offering the user carburetion backed by 40 years' experience. Write us or consult ENSIGN field men on your carburetion problems.

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Filters Need Servicing In LPG Operation

Because crankcase oil remains so noticeably clean in LPG-powered engines, many operators are inclined to overlook the necessity of servicing air filters and oil filters. Air contains the same amount of dust, whether the engine is operating on propane, butane, gasoline, or diesel fuel. No air filter is 100% efficient, particularly after it has been in service 2000 or

3000 miles after being cleaned and re-oiled. Some dirt is certain to go through, and make its way into the crankcase. That makes it necessary to change the oil filter cartridge periodically.

Air filters on the carburetor inlet and the crankcase breather should be serviced at least every 2500 miles on vehicles used exclusively on paved highways—often if the engine is in dirty work, like construction jobs, tractor operation, etc. Engines that

stand idle for long periods are not immune to the need for air filter service, as the oil on the filter elements dries out, and becomes useless as far as catching air-borne dirt is concerned.

Oil filters should be serviced at intervals of from 8000 to 10,000 miles on LPG-powered engines.

J&S Engineered Kits For GMC, Chevrolet

A new conversion kit for Chevrolet cars and trucks, and GMC trucks up to the 302-cu. in. models, has been announced by J&S Carburetor Co., Dallas. The kit employs a special casting which mounts on the front of the engine block in place of the regular thermostat housing, and contains the J&S vaporizer and thermostat. The J&S filter and regulator are

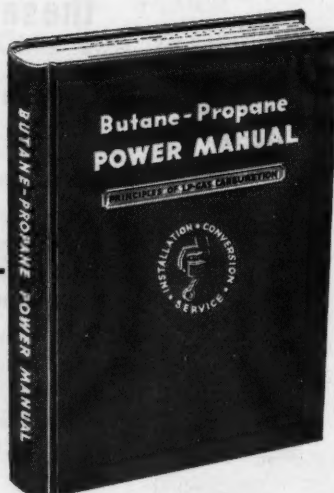
The "Know-How" you need for Installations and Conversions

Butane-Propane POWER MANUAL

Second Printing — Nov. 1953
With Revisions

Published by

BUTANE-PROPANE News



Here is the first authoritative guide ever published for the rapidly expanding LPG power market. Basic facts of engines, fuel, and power are given in easy-to-understand language; then careful directions and clear illustrations take you step-by-step through installations, conversions, servicing . . . everything needed in a practical working manual for practical men. Nearly 5,000 copies of the BUTANE-PROPANE POWER MANUAL have already been sold.

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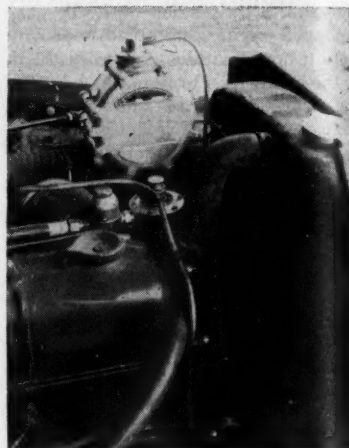
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mounted on the same casting, thus eliminating the need for a mounting bracket, or the drilling of any mounting holes.

Only one water hose is required, which connects either to the cab heater or to the suction side of the pump. The Zenith carburetors found on GMC trucks are converted with the J&S sandwich-type adapter (adapter plate), and Chevrolet kits are furnished with a similar sandwich adapter for Rochester carburetors. GMC trucks using Holley carburetors will require a carburetor bowl which has been factory-spudged for gas.

This kit, which fits all models of the above trucks since 1940, is similar to the Ford V-8 and International Red Diamond kits recently developed by J&S. Installation time is cut down to a matter of minutes, as compared to conversion labor of several hours on conventional kits. Complete, illustrated "How to Install" instructions come in each kit.

Shell Opens Second Western Anhydrous Ammonia Plant

The Shell Chemical Corp. opened its second California anhydrous ammonia plant recently in Ventura, Calif. The new plant, built at a cost of about \$10 million, will have a productive capacity of 150 tons a day.

Frank D. Kuenzly, formerly superintendent of Shell's Pittsburg (Calif.) plant, is manager of the new plant. The bulk of the company's ammonia production is earmarked for western agriculture, where the use of ammonia as a fertilizer has increased markedly in recent years. In 1942, the Rocky Mountain and Pacific coast states used a total of 382,266 tons of fertilizer; in 1952, the farmers of California alone used 750,000 tons.

The 27-acre plant site north of Ventura was chosen because of the rapidly growing need for ammonia fertilizer in California and Arizona and because Shell's operations in the Ventura oil field offer an ample supply of natural gas needed in the ammonia manufacturing process without interference with other industrial and domestic uses.

Heated Suit for Winter Work Operates on Propane

Here's another load to add to your winter heating market: A suit heated by propane to keep construction workers, hunters, soldiers, and anyone else who's out in the cold, warm when it's freezing outside has been invented by a mechanical engineer, Robert E. Hopp.

The garment looks like a form-fitting sleeping bag with a pint-sized flame thrower attached. It works by vaporizing liquid freon, and circulating the hot gas through an intricate layout of rubber tubing sewn into the suit's lining.

Heart of the system is a metal, 2½-lb. heating unit that clips onto the wearer's belt. It is powered by a tapered cylinder with 3 oz. of propane, enough for 12 hours.

Gulf Refining Building Louisiana Cycling Plant

Recoveries of approximately 10 million bbls. of propane, 10 million of butane and 6.5 million of natural gasoline annually are expected from a new cycling and gasoline plant to be constructed in Louisiana by Gulf Refining Co.

The \$10 million plant will be constructed in an area 35 miles west of Baton Rouge, La. Associated in the project with Gulf are Humble Oil & Refining Co. and the Texas Co.

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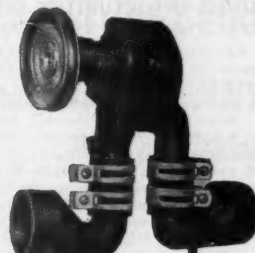
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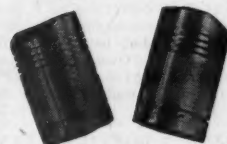
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HELP WANTED

SEVERAL DESIRABLE TERRITORIES available for full time Sales Engineers to sell line of L. P. valves, regulators, accessories. Write Box 210, BUTANE-PROPANE News, 198 S. Alvarado St., Los Angeles 57, Calif.

LPG CARBURETOR MANUFACTURER has opening for experienced carburetor salesman. Prefer man with engineering background or good knowledge of engines, willing to learn, travel, neat appearance. Must be able to get results. Good references. When answering give history for past 10 years. All replies confidential. For more details, write Box 215, BUTANE-PROPANE News, 198 S. Alvarado St., Los Angeles 57, Calif.

WANTED — EXPERIENCED SALES representatives. We have openings for aggressive sales representatives with experience in sale of L. P. gas and anhydrous ammonia systems. Openings in Eastern, Middle West and West Coast areas. State experience and full information in application to: General Manager of Sales, The J. B. Beard Co., Inc., P. O. Box 1115, Shreveport, Louisiana.

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FOR SALE: ONE OF THE FINEST LPG businesses in this part of the south. Doing around \$158,000 gross—a balanced gas load. Never a gas shortage, can furnish good gas contract. More than ample storage; late model trucks; located in rich farm country; 698 diversified customers; 7¢ margin on gas; no competition in town. A big profit maker—long bright future ahead. You will be shown the books and reason for offering for sale. Will require \$35,000 down payment. It will pay you to come for a look. Write Box 110, BUTANE-PROPANE News, 198 S. Alvarado St., Los Angeles 57, Calif.

FOR SALE: GROWING L. P. GAS BUSINESS in rich southern farming area. Bulk storage, trucks, etc., including bottle filling plant. Wonderful opportunity. Owner retiring from active business. Write Box 150, BUTANE-PROPANE News, 198 S. Alvarado St., Los Angeles 57, Calif.

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FOR SALE — BUTANE AND PROPANE gas business located in North-Central Florida. Now doing 500,000 gallons, can easily be increased to million gallons yearly. Must be able to pay \$50,000.00 down. Write Box 220, BUTANE-PROPANE News, 198 S. Alvarado St., Los Angeles 57, Calif.

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CONTACT US TODAY TO BUY OR SELL a gas business. We cover all states east of the Miss. River—from Minnesota to Maine to Miami. We're in Florida because it's a good place to live—it's easy to reach your from here. Today we have a Miami company for \$110,000 cash; central Tennessee for \$270,000 terms; west coast Florida for \$275,000 terms. SALES, APPRAISALS, FINANCING. MEMBER LPGA and AGA. EDWARD R. GOUDIE INC., Box 1177, Stuart, Florida. Tel.: 450.

FOR SALE — TRUCKS AND TRAILERS

USED PROPANE DELIVERY TRUCK FOR sale. L-160 International, 2-ton, with Model 100, 1400 gal. twin tanks, mechanical seal pump. Ensign propane carburetion, hose, piped complete. This unit was placed in service new 15 months ago and is in good condition with approximately 19,000 miles. Easy terms. \$3,195.00 plus meter cost if one is wanted. White River Distributors, Inc., Batesville, Ark.

1½-TON INTERNATIONAL with 29,000 miles in good condition with NEW 900 gal. single propane tank, skirting, no plumbing. \$1,750.00. Can pipe to your specifications with new pump, etc., for slight additional charge. Terms. White River Distributors, Inc., Batesville, Ark.

READY TO GO. BRAND NEW, 1954 1-TON Chev., big motor, 700 x 18, 8-ply duals on rear, with new 600 gal. single propane tank mounted on truck. Easy terms. This is ideal for cylinder filling or spare truck. \$2,645.00. We can pipe to your specifications in one day at our regular piping prices. White River Distributors, Inc., Batesville, Ark.

PROPANE TRANSPORT TRACTOR AND semi-trailer, 35' dual axle semi-trailer, 6200 gallon water capacity propane tank, 100 gpm electrically operated Smith pump, 5 hp explosion-proof motor, 100' cable, mounted on trailer, 1100 x 20 tires. 1949 G.M.C. 3 axle tractor, 205 hp G.M.C. diesel motor, air brakes, good condition. Allyn Tank Line, 14011 South Central Ave., Los Angeles 59, Calif. Telephone NEVada 6-1871.

FOR SALE—TRUCK TANK 1200 GALLON Dodge, 1946. Good condition. \$1900.00. Write Box 230, BUTANE-PROPANE News, 198 S. Alvarado St., Los Angeles 57, Calif.

FOR SALE: 1948 CHEVY CAB-OVER, 2-ton, 2-speed axle, 8:25 x 20 tires, 1430 gallon twin propane tanks, pump, hose, lights, carburetion. \$1995.00. Southwest Gas Equipment Co., Box 390, Liberal, Kansas.

FOR SALE: 1953 DODGE, 2-TON, 5-SPEED transmission, 8:25 x 20 tires, 1460 twin tanks, pump, hose, lights, carburetion, 10,000 miles. \$3795.00. Southwest Gas Equipment Co., Box 390, Liberal, Kansas.

FOR SALE: 1952 DODGE, 2-TON, 2-SPEED axle, 8:25 x 20 tires, 1430 twin propane tanks with new white paint, lights, reflectors, hose, pump, piping, etc. Ready to go. \$2995.00. Southwest Gas Equipment Co., Box 390, Liberal, Kansas.

FOR SALE—TRUCKS & TRAILERS—Cont.

NEW: IMMEDIATE DELIVERY, 1400 WG U69 propane extra lightweight twin barrel delivery unit. Mounted on new 1954 2-ton, 2-speed Chevrolet truck with big engine. Fill and vapor hose assemblies—Viking Mechanical Seal Pump —Power take-off assembly and motor fuel tank. READY TO GO FOR \$3970.00 tax paid. Also available at low extra cost: meters, fire extinguisher and L. P. carburetion. American Tank & Manufacturing Co., 2136 West Commerce Street, Dallas, Texas. P. O. Box 5525. Telephone Riverside 9183.

NEED A WORKHORSE? WE HAVE NEW 1953 Model 353 GMCs; 2 ton, 2 speed, w/8.25 tires equipped with a 1400 WG Nor-Tex Standard Twin Propane unit. It's skirting, plumbed and perfectly balanced! Complete with recessed fuel tank, Viking KK190 pump with mechanical seal, 50' filler hose, ICC lights and power take-off with spline jack shaft. Finish is aluminum paint over red oxide. Tax paid and ready to go. \$4043.80 FOB North Texas Tank Co., Box 519, Phone Central 5416, Denton, Texas.

A PACKAGE UNIT SPECIAL! A NEW 1953 2-ton, 2-speed Chevrolet equipped with a 1250 WG Nor-Tex Standard Twin Propane Unit. It's skirting, plumbed and perfectly balanced! Complete with recessed fuel tank, Viking KK190 pump with mechanical seal, 50' filler hose, ICC lights and power take-off with spline jack shaft. Finish is aluminum paint over red oxide. Tax paid and ready to go \$3919.85 FOB North Texas Tank Co., Box 519, Phone Central 5416, Denton, Texas.

SPECIAL: AMERICAN "BETTER-BILT" extra lightweight 1500 water gallon U69 propane twin barrel delivery unit, with Viking Mechanical Seal Pump—Neptune Print-O-Meter—fill and vapor hose assembly—mounted on new 1954 2-ton, 2-speed GMC chassis with 8.25 tires —READY FOR SERVICE. PRICED AT \$4475.00 tax paid FOB Dallas. Other sizes available at comparable low cost. American Tank & Manufacturing Co., 2136 W. Commerce Street, Dallas, Texas. P. O. Box 5525. Telephone Riverside 9183.

COMPARE OUR PRICES — A NEW 1400 W. G. twin Model 100 propane tank with Viking KK-190 pump, PTO, plumbing, ICC lights, filler hose, white enamel, Neptune #433 Print-O-Meter; excise tax paid, mounted on NEW 1954 6400 2-ton, 2-speed Chevrolet or Ford: \$4,230.00. Easy terms. WHITE RIVER DISTRIBUTORS, INC., Batesville, Ark.

IN A HURRY FOR A PROPANE TRUCK? Immediate to 3-day delivery on any model NEW unit, 600 to 2,000 gallon. Any type pump, meter, propane carburetion, etc., that you desire. All units are tested for leaks by pumping gas through them before they leave our shop. SEVERAL USED UNITS also available. 25% down, balance in 18 payments with 5% interest financed through our local bank. CALL US DAY OR NIGHT ANY DAY. Preston W. Grace, White River Distributors, Inc., Phones 570 or 686, Batesville, Ark.

TRANSPORT FOR SALE: 1951 GMC 470 tractor, excellent condition. 3600 gal. tanks on shop-built trailer. Rubber like new. Will sacrifice for \$3800.00. Lally's Furniture Store, 115 N. Main St., Newton, Miss.

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FOR SALE—TRUCKS & TRAILERS—Cont.

PERFECTION PLUS! A NEW 1400 WG twin Trinity model #103 propane unit with double door rear compartment, housing Neptune #433 Print-O-Meter and remote control Okadee valves; excise tax paid, KK190 Viking pump, PT&DS, plumbing, ICC and directional lights, fuel tank, filler hose, white enamel, mounted on 1953 2-ton 2-speed F-600 Ford or #6400 Chevrolet chassis. \$4550.00 FOB Trinity Steel Co., Inc., 3301 S. Lamar, HUNter 8321, Dallas, Texas.

A DELUXE TRINITY TWIN UNIT MOD-103, complete with KK-190 Viking pump, remote control Okadee valves, Neptune Print-O-Meter, 54 gal. fuel tank in rear compartment, 50 ft. filler hose, white enamel and tax paid, mounted on new 1953 RP-160 factory LPG equipped International chassis, ready to go at \$4,988.00, F.O.B. Trinity Steel Company, Inc., 3301 S. Lamar St., Dallas, Texas. Phone HUNter 8321.

USED PROPANE DELIVERY TRUCK FOR SALE, 1953 Chev. 2-ton, 2-speed axle, heater. Ensign propane carburetion with 1400 W. G. twin propane tank, Model 100, mechanical seal pump, hose, piped complete. This unit is only 6 months old with 11,000 miles. Excellent condition. A bargain at \$3,495.00. Easy terms. Int. also. White River Distributors, Inc., Batesville, Ark.

THIS IS IT—NEW 1954 INTERNATIONAL RP-160, factory equipped for propane, 2-speed, complete with 1400 W.G. twin propane tank, mechanical seal pump, filler hose, piped complete, painted, lights and ready to deliver gas at only \$4,255.00. Add \$190.00 for 1600 twin or \$300.00 for 1800 twin. 25% down, balance 18 months at 5% interest. White River Distributors, Inc., Batesville, Ark.

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All orders C.O.D.

FOR SALE: 1460 GALLON TWIN TANK, only, with skirting, U69, 200 WP. \$1225.00 plus Federal tax. Southwest Gas Equipment Co., Box 390, Liberal Kansas.

18 PROPANE MOTOR FUEL TANKS made for a bus company. New U69, 124 gal. W.C. Double tank with all fittings recessed. 22½" x 80". Perfect for tractor trailers. Original price: \$350. — Our price: \$200, single lot. Quantity discount for more. **FIVE 45 GAL. W.C. PROPANE MOTOR FUEL TANKS.** New U69 recessed controls, 17½" x 46½". \$45. Both FOB Middletown, Delaware. Phone 2902. Send check or money order. Schagrin Gas Co., Middletown, Delaware.

FOR SALE: BUTANE CYLINDERS, 60 LB. capacity, ICC, with valves, used. \$5.00 each. FOB Cleveland, Ohio. The Home Gas Equipment Co., 1301 Carnegie Ave., Cleveland 15, Ohio.

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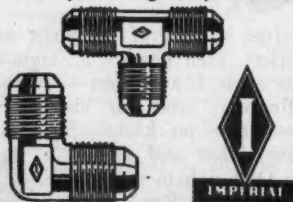
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